WHAT EVERYONE OUGHT TO KNOW

OLIVER T. OSBORNE M.D

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WHAT·EVERYONE
OUGHT·TO·KNOW

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OLIVER THOMAS OSBORNE

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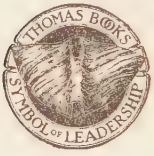

PREFACE

The object of this book is to present in simple language some of the truths concerning the wonderful mechanism of the human body and to outline some of the delicate physiologic processes which insure growth and maturity, and promote nutrition and health. To further the objective of "keeping well," nutrition, foods, exercise and general hygienic rules are discussed.

The various infective causes of ill health are listed, and how they are acquired and the efficient measures of prevention are described.

Chapters are devoted to the growth of children, to their mental and physical health, and to their early school life.

Some of the many accidents that occur to civilized people are discussed from the standpoint of the layman and his responsibility in giving first aid.

The book is not intended to offer treatment for diseased conditions. Self-treatment is always of doubtful value and is frequently dangerous, often allowing a simple indisposition to develop into serious acute or chronic disease.

The author sincerely hopes that the book will cause a better understanding of one's self and one's fellows, and that it will promote health and aid in preventing disease and its consequent unhappiness and even financial stress.

85533

CONTENTS

I. GROWTH AND DEVELOPMENT . . 1

Height and Weight 6

Eugenics 9

Old Age 11

Endocrine Glands 14

II. FUNCTIONS OF THE BODY . . . 21

Respiration 21

Circulation 25

Blood Pressure 28

Blood 30

Water 32

Excretion 37

Sleep 43

III. NUTRITION 49

Digestion 49

The Tongue 55

Constipation 58

IV. FOODS 65

Proteins 65

Eggs 75

Milk 75

Vitamins 77

Carbodydrates and Vegetables . . . 79
Sugar . . . 80
Fats . . . 82
Minerals . . . 83
Phosphates . . . 84
Calcium . . . 84
Iron . . . 85
Iodine . . . 86
Fruits . . . 87
Coffee and Tea . . . 89

V. DIET . . . 97
Infant Feeding . . . 99
Obesity . . . 104
Food Poisoning . . . 108

VI. PROMOTION OF HEALTH . . . 111
Health Axioms . . . 111
Choosing a Physician . . . 116
Clothing . . . 121
Shoes . . . 123
Bathing and Swimming . . . 126
Seasons . . . 129
Heat . . . 133
Air . . . 133
Climate . . . 134
Mineral Springs . . . 137

VII. THE MOUTH 142
Teeth 142
Mouth Infection 147
The Toothbrush 158
Preservation of Teeth 160
Tonsils 163
Lingual Tonsil 165
Adenoids 166
Lymphatic Glands 167

VIII. THE CHILD 169
Examination of Preschool Child . . 177
Schools 181
School Hygiene 184
Feeble-minded and Backward Child . . 189

IX. SOME STATISTICS 192
Employment of Females 194

X. EXERCISE 196
Marathons 204
Rest Cure 207

XI. INFECTION 212
Disinfection 215
Antiseptics 217
Nasal Douching 219
Gargling 222
Physical Treatments 223

XII. PREVENTION OF DISEASE . . . 227
Insects 232
Rickets 234
Scurvy 235
Cough 236
Colds, Influenza and Pneumonia . . 238
Hay Fever and Asthma 239
Tuberculosis 241
Typhoid Fever 242
Whooping Cough 243
Diphtheria. 244
Scarlet Fever. 244
Measles 245
Mumps 245
Small Pox 245
Lock Jaw 247
Hydrophobia 247

XIII. HABITS 249
Narcotic Drugs 249
Tobacco 254

XIV. ACCIDENTS 262
Tragedy 264
Management of Emergencies 268
Sunstroke 269
Heat Prostration 269
Drowning 270
Electric Shock 271

Burns 272
Convulsions 273

XV. POISONS 276
Industrial Poisoning 278

XVI. THE SKIN 281
Itching 282
Ivy Poisoning 283
Eczema 284
Eczema in Children 285
Chapped Hands 286
Chilblains 286
Ringworm 287
Warts 288
Ingrowing Toenail 288
Hair 288
Emollients 290
Cosmetics 292

XVII. NOSTRUMS AND QUACKERY . 294

Chapter I

Growth and Development

Heredity.—Heredity is a large factor in the mental and physical health of the new-born babe and young child. Mental deficiencies in the parents and grandparents (or even great-grandparents), and alcoholism, syphilis, and epilepsy in the progenitors are causes of the production of defective children. Serious chronic disease in the mother or father, as tuberculosis and cancer, or some less serious chronic disease in the mother may cause the child born during such a condition to be defective. Deficiencies or disturbances of the glands of internal secretion, the so-called endocrine glands, typified by the thyroid (goiter) gland, will cause serious defects to be present in children born during such conditions. Doctor E. Bosworth McCready, of Pittsburgh, Pa[1]. is an acknowledged authority on the normal and abnormal development of children, and the author freely quotes his findings.

The Normal Child.—A child that is normal and develops normally should show approximately the following progress: on the first or second day the child's eyes should be sensitive to light. At the end of about the second week he should show pleasure when looking at moderately bright objects, as the light of a candle. Of course the light must not be too intense. He should begin to hear on the fourth day, and should discriminate sounds in three to four weeks. At the end of the first week he shows some

[1]McCready, E. Bosworth; Internat. Clinics, Vol. III, Series 32

sensibility to taste. During the first week he should enjoy nursing and bathing, and should notice objects. At the same time he should display discomfort from cold, hunger, and too tight clothing. He should smile about the end of the third week. By the end of a month vowel-sounds are uttered, noted in crying. Memory is first noted by taste and smell, then to touch, sight and hearing. The eyes do not coordinate during the first month, reflexes are active, and he should sleep the greater part of the time.

During the second month the eyes begin to coordinate, he notes voices and sounds and turns his head toward them, is startled by loud noises, and seems to enjoy musical sounds. During the latter part of this month he begins to laugh when tickled, and by the end of the month will clasp objects with four fingers. At the end of this second month the first consonants are uttered.

During the third month the accommodation of the eyes improves, he listens to sounds, and shows pleasure at sight of his parents or nurse.

During the fourth month the action of the eyes becomes perfect, objects are grasped and moved so that he can see them, and he shows pleasure in looking in a mirror. During this month the thumb begins to act in conjunction with the fingers.

During the fifth month he notes strangers and looks inquiringly at them, and he takes pleasure in crumpling papers, pulling hair and ringing a bell. He begins to sleep ten to eleven hours without food; stretches out his arms for objects and seizes and carries them to his mouth.

In the sixth month he raises himself to a sitting posture, laughs and moves his arms up and down when pleased, and "coos" or "crows."

During the seventh month he shows signs of astonishment by opening his mouth and eyes. He sighs, imitates movements of the head, and averts his head as a sign of refusal.

During the eighth month he shows astonishment at new sounds and sights, and moves his hands more accurately in obtaining something.

In the ninth month he stands on his feet with support, shows interest in everything, strikes his hands together with joy, turns his head away and shuts his eyes when anything disagreeable approaches him; shows some fear of animals; can turn himself over when laid face downward; and begins to understand some questions.

In the tenth month he sits up without support for long periods and may begin to attempt to walk.

In the eleventh month he stands without support; stamps his foot; repeats syllables correctly; and begins to utter more consonants.

In the twelfth month he moves about and creeps.

In the thirteenth month he shakes his head in denial, begins to say "papa" and "mama," and understands spoken words.

In the fourteenth month he walks with support and can get up on his feet by holding onto something.

In the fifteenth month he walks without support, and repeats syllables.

In the sixteenth month he runs alone and rarely falls.

From the seventeenth to the twentieth month he begins to associate words with objects and actions; imitates different things, as brushing his hair, washing his hands, blowing a horn, etc.

From the twentieth to the twenty-fourth month he pretends to read; marks on paper with a pencil; attempts to talk, but can not be understood; tries to sing, and will generally do ordinary things he is told to do.

From the twenty-fifth to the thirtieth month he begins to distinguish colors, forms sentences of several words, asks questions, begins to climb and jump, and begins to say "me" and later "I."

From two and a half to three and a half or four years he begins to climb stairs without assistance; sentences are correctly used; words are distinctly spoken; he asks innumerable questions; and begins to ape the language and speech of his family.

THE ABNORMAL CHILD.—Any child who does not develop approximately as above outlined is abnormal, and consultation should be had with the family physician and with specialists. Many times the causes of the mal-development may readily be corrected. Imperfect nutrition, insufficiency of some one or more of the internal secreting glands, and mismanagement of the child's life are causes that can be corrected. Most children are overstimulated, are taken about too much, are allowed to be tired by phonographs, radios, too much electric light, etc., etc. An older child that badly misbehaves, has brainstorms, plays truant, does not advance in school work, has a terrible temper, cannot sleep,

has no appetite, or does anything absolutely abnormal requires medical supervision and an examination to discover any physical defect that may be present. Many children having such defects and having them corrected become perfectly normal. The most frequent causes are adenoids, diseased tonsils, diseased teeth, defective eye-sight, and defective hearing.

If a child does not learn to walk in at least about a year and a half, there is generally some glandular trouble, subnormal mentality, or rickets. Rickets not only affects the bones, especially the ends of the bones and the joints, but also seems to affect the ligaments. An early sign of rickets is an abnormal mobility of the knee joints.

Rickets is not the only cause of weakened joints. Some children have distinct muscle weakness, which allows the joints to be very mobile and prevents normal strength in standing and walking, causing the knee and ankle joints to become deformed. These children have their ankles turn readily, their bones creak, their legs bend and they frequently fall down. Sometimes it is difficult for them to hold their heads up straight when walking. Such children have a distinct muscle inferiority, and require study by a physician who specializes in endocrinology, that is, the study of the endocrine glands of the body. Softening of the bones and imperfect joints or weak joints may be due to deficiency of the thymus gland, which is located in the upper part of the chest. It should be very active until about the time the child matures; its secretion has largely to do with normal

bone growth and development up to the time of puberty. If its secretion is much interfered with and other glands are active, especially the thyroid, too early puberty is likely to occur.

In some families all the children learn to walk late; but if there is some reason, as a lack of muscle tone and weakened joints, the recovery from the condition may take not only months, but several years.

Height and Weight

A person weighing a hundred and fifty pounds carries about one hundred pounds of water, as water represents about two-thirds of his whole organism. If he weighs about one hundred and twenty-five pounds, he will have about eighty pounds of water, ten pounds of which is circulating in his blood.

According to Skelton[2] half of the water of the body is in the muscles. The skin contains about one-fifth of the water; the blood about seven per cent., sixty-seven per cent. of which is in the plasma and thirty-three per cent. in the corpuscles. When there is hemorrhage or any great loss of blood the muscles give up water to supply the demand of other parts of the body and the blood. In other words, the muscles are the water reservoir of the body and a safeguard against rapid dehydration, which means loss of water. If the loss of water continues from any cause, as by more hemorrhage, watery diarrhea, profuse perspiration, or increased urination, the skin will give up some of its water, and by this process becomes shriveled and dry. The liver seems to be quickly affected by loss of water.

[2] Skelton; Archiv. Intern. Med., Aug. 1927, p. 140.

The height of course varies with the growth of the child to the adult, and the weight normally should correspond to the height. Boys during the growing period and early adult life should normally weigh more than girls.

Average Height and Weight for Boys

Five years of age	44 inches	45 pounds
Ten years	53 "	68 "
Fifteen years	64 "	114 "

Average Height and Weight for Men

Twenty years of age	5 feet	117 pounds
	5½ "	136 "
	6 "	160 "
Thirty years	5 "	125 "
	5½ "	145 "
	6 "	172 "
Forty years	5 "	130 "
	5½ "	150 "
	6 "	180 "
Fifty years	5 "	135 "
	5½ "	152 "
	6 "	183 "

The average weight for girls in childhood is a little less than for boys. In the late teens and upwards the woman ordinarily weighs from five to ten pounds less than the man at the same age and height.

A man's clothing weighs from six to seven pounds, while a woman's clothing weighs, at the present era, not much over two pounds. A man's shoes increase his height about one inch, while a woman's shoes,

with the high heels so frequently now used, would increase her height from one and a half to two inches.

Up to the age of ten the normal child should gain in weight every month, although there may be but little gain for one or two months and then more the following months. Emerson[3] finds that there is more gain in children from five to ten years of age during vacations than when they are in school, probably on account of being more out-of-doors.

A normal man should be about sixty-eight inches in height, and the measurement from the tip of one middle finger to the tip of the other, when the arms are extended laterally, should be the same number of inches as his height. The circumference of his chest should be about thirty-four inches, and of the abdomen at the waistline about thirty-two inches. The average height of a normal woman should be about sixty-four inches, and the extended length of her arms the same, namely sixty-four inches. Her chest measurement at rest should be about thirty-two inches, and the circumference of the abdomen at the waistline should be not far from thirty inches.

The adult may have his weight vary from twenty-five pounds above to twenty-five below the average and yet not be abnormal for him. In the young adult below normal weight is more significant of possible tuberculous tendency than in those over thirty. Overweight especially after thirty, is always a subject for careful consideration, as excessive over-weight individuals are not likely to be long-lived. In evaluating

[3] Emerson; Journal A. M. A., Oct. 15, 1927, p. 1326.

under- or over-weight the family must be considered. If the majority of the family, or even one branch of the family, is over- or under-weight, the person under discussion with either one of these family tendencies should not be considered, necessarily, abnormal. In all persons, young or old, and particularly in youth, sudden deviation from normal weight, especially if a loss, calls for a very careful investigation.

Eugenics

By this term is understood anything that will improve the human race, either mentally or physically. Heredity and environment are the two factors that are most important in the development of physical and mental health. Environment may improve or mar heredity, but it can not change it. Heredity is therefore the most important factor in producing an ideal race. The importance of environment in causing and continuing physical and mental health is of course unquestionable, but environment can not eliminate an hereditary tendency to disease or to mental or physical insufficiency. Neither can environment develop perfect mental and physical health when there is an inherited insufficiency in any particular organ or organs, although environment and treatment may improve deficiency caused by injury or acquired by disease.

The "survival of the fittest" is a term that was perfectly true many years ago, the "unfit" falling by the wayside. At the present time, through many charitable organizations and much instruction in hygiene, and through the greater success of skilled

medical care, very many of the "unfit," that is, those who are not mentally and physically perfect, survive. Many of these "unfit" marry and have defective children. As a result our orphan asylums, hospitals, sanatoriums, jails, prisons, and insane asylums are over-filled with physical and mental defectives. It would seem that higher education and higher knowledge of eugenics would cause laws to be enacted that would prevent marriage of those who are physically and mentally unfitted to have normal children.

One of the most serious effects of war is that those men who die in battle are generally young and the most "fit"; the "unfit" are not accepted as soldiers for the front.

For at least three years during the period of a child's gestation and the early years of its infancy the mother must be protected and cared for by the father. If he fails in this duty, some other person, or some charity, or the community must assume this duty. This being the fact, worthless, lazy, and mentally and physically diseased fathers are a tax on the community.

It has been estimated that there are over 900,000 persons in the United States who are supported by public funds on account of crime, feeble-mindedness, and insanity, and including those who are in alms houses or are otherwise delinquent. It also has been estimated that there are over 235,000 insane in the United States, to care for whom there are about seventy-five state institutions and over 500 private institutions.

Old Age

It is an old saying, but more or less true, that a man is as old as his arteries. This means that in old age there is a lack of normal elasticity of the arteries and the beginning of arteriosclerosis, hardening of the arteries. On the other hand, some individuals are old young, and even some children are old. Others are never old, no matter what the arterial condition is or what the age. There seems to be no doubt that longevity is a family trait. Some families die in early or late middle age, and other families, except by accidental deaths, live to old age. Death due to typhoid fever, pneumonia, or to any acute infection may be almost termed as accidental. They are not caused by degeneration of tissues or organs.

Sanitary medical science is largely decreasing the infections and the deaths due to food and water poisons. It is not decreasing the incidence of circulatory and some organ degenerations. In other words, heart disease, kidney disease and diabetes are on the increase. Scientific care prevents the death of many defective children, therefore many ill-conditioned (mentally and physically) infants live to reach childhood and some reach early adult life carrying handicaps, and these individuals increase the death rate in periods of life other than infancy and early childhood.

The cause of so many deaths, especially of business and professional men, in the fifties and early sixties, and sometimes even in the forties, is largely the restless strenuosity of our lives. Another very important cause, and perhaps the most important, is

chronic focal infection, which seems to be now a very frequent condition in almost every adult. The major part of such infection is in the teeth and tonsils. These slow-going infections cause absorption of toxins, if not of bacteria, which affect important glands of the body and important organs, particularly the heart, kidneys, pancreas and liver.

Association with youth and children keeps older people from showing signs of old age. Also normal mental activity, whether actual brain work or interest in some hobby, or not too strenuous play, is a splendid preventive of old age.

It has been stated that this is the age of young men, and that employers do not care for older men in their employ. However, the most valuable workers in all classes of work and all types of work are very frequently the older men and women. It is of course true that some older persons become careless, indifferent, and mentally apathetic, and do not "carry on" well. There are other older persons who seem to improve their mental and physical work, if their health is good, with their years of knowledge and increasing wisdom. The splendid record of many elderly persons is very interesting, and shows that there is no age limit to mental perfection.

Idleness, indifference, lack of interest, and worry tend to cause old age. While it is commendable, from one standpoint, for an old man or an old woman to be very active, very enthusiastic, and even, sometimes, to act "kittenish," excessive activities are not to their advantage. It is generally a pose and is followed by unnecessary tire. Fine enthusiasm in

old age, a willingness to partake of all types of social pastimes and plays, makes for prolongation of youthful feelings, but too much strenuosity is dangerous in old age. On the other hand, one who frets, because he can not do all the things that younger people do, tends to develop mental deterioration and even melancholia. As the years roll by the gradual letting down of certain strenuosities, either mental or physical, with more time given to mental relax ation and physical rest, with active enjoyment of what is done, will prolong youthful feelings in old age. The *gradual* withdrawal from extra or outside duties is always advisable. Avoidance of too much haste, and, if possible, the avoidance of duties that are very disagreeable to the person tend to prolong good old age.

Old people should not be too much alone. They should partake of home life, especially with the youth of the family, and such social life as is offered.

Nothing tends to hasten old age more than the continued preparing for such a condition and always thinking about what one will do or will not do when he gets old. At what age one is old is an individual determination; some are quite old at forty, others are young at eighty.

As one grows older, from fifty upwards, physical strains should not occur. Too many hours of strenuous mental activity must be avoided. Less food should be eaten, especially less proteins. If a man has been a smoker all his life, he should lessen the amount. If normal sleep can not be well obtained, he should avoid any stimulant, after the noon meal,

that would prevent him from sleeping, such as any stimulating drug, coffee and tea.

Nervous irritability, restlessness and sleeplessness may be caused by the necessity for a change of glasses, or if correct, the glasses may not be properly adjusted. In other words, eyetire is a frequent cause of sleeplessness, even without headache. Also eye-strain can cause indigestion.

If indigestion causes sleeplessness, and in fact, if the person has much indigestion, the proper diet for him should be carefully outlined by his physician. Rich, indigestible foods, even if well tolerated when the person was younger, should now be avoided and heavy meals should not be eaten, and especially not at night. Late evening meals should be abolished, although some simple nutriment, as malted milk, or crackers and cheese, may be taken before bedtime, if desired.

The Endocrine Glands

These glands, which are also termed internal secreting glands, are on the inside of the body. Each one furnishes, daily, one or more secretions that are necessary for the health, growth and general welfare of the body, both physical and mental. They consist of the thyroid and four parathyroids, which are located in the anterior portion of the neck; the pituitary (the hypophysis) which is located in the head; the thymus which is located in the upper part of the chest; two suprarenal, also called adrenal, glands which are located above the kidneys; and the pancreas, located in the upper part of the abdomen, which furnishes not only a digestive secretion, but

also, from little islets in its tissue, a secretion that is necessary for the proper utilization of starch and sugar. When these little islets are diseased diabetes is caused. The gonads are also endocrine glands. These are two ovaries in the female and two testicles in the male.

Several other glands of the body may furnish some chemical secretions other than the physiologic activities that they are known to have, as for instance, the liver, which produces the bile for digestion. The liver is the largest gland of the body, an important function of which is to render harmless many substances, produced by the physiologic processes of the body, which would otherwise be poisonous. The reason that the dose of many drugs given by the mouth is larger than when the same drug is administered hypodermically is because when taken into the stomach it is partially rendered inactive by the liver before it reaches the general circulation. Drugs that are given hypodermically, or are injected into the blood vessels, do not at first pass through the liver and therefore are more active, even in the same sized dose, than when administered by the stomach. Hence the dose of a drug given hypodermically is smaller than the dose of the same drug when given by the mouth.

An activity of the liver which has recently been discovered is its ability to combat pernicious anemia. When the disease is present and animal liver is eaten, or when an extract of animal liver is administered, great improvement takes place.

The amount of active secretion given daily to the

blood by any one of these small glands is not large and in some instances is very small, and they are subject to all the disturbances that any other part of the body may develop. A gland may secrete too much or too little, and in either case abnormal symptoms occur. There is a constant balance between the secretion of the endocrines, and if one has its activity disturbed, one or more other glands will also have their activities disturbed and become abnormal. Some of these glands are more active in early life, in babyhood and childhood. Others are more active after puberty, while some become inactive in old age.

The activities of the endocrines determine the rapidity or sluggishness of growth in babyhood and childhood, the normal development of the brain, the normal development of the teeth and the growth of the hair, the character of the skin, the amount of fat and where the fat is deposited, and the general family characteristics. One family may have its members mostly tall, slim, and of dark or light complexion, while another family may have its members short and fat, and dark or light. Even the facial characteristics depend on these little glands.

If it is determined early by the physician that the baby or young child shows insufficient activity of one or more of these glands, many times the condition may be corrected by the proper administration of glandular tissues and extracts made from the similar glands of certain animals, especially cattle and sheep. To be more explicit, the rate of the child's growth, that is, his bone growth, the development

of his face and head, the eruption of the teeth, the condition of the skin, his mentality, the color of his hair, the color of his eyes, the age at which puberty develops, the length of the legs, the length of the body, and the general mental and physical characteristics all depend on these glands.

Privation of certain foods or certain vitamins will interfere with the proper activity of one or more of the endocrines. If either parent, especially the mother, has any chronic disease; a chronic or acute infection; is greatly debilitated; has suffered from privation of food; has had much alcohol; and if the mother has had too many or too rapid pregnancies, which cause some of her glands to become defective, the activity of one or more of the endocrine glands in their children is likely to be defective as a consequence.

One child is precocious and another child is a moron, because of the excessive activity in the former case and of the under-activity in the latter case of one or more of these glands. An idiot is such because of total or almost total absence of the activity of one or more of the endocrines. A cretin is a child who has practically no thyroid gland. Mental characteristics, personality and idiosyncrasies depend on the relationship of the secretion of each of these glands to the other glands. Absence of hair, normal growth of hair, or increased growth and the character of the hair all depend upon the activity of several glands, especially the thyroid, the pituitary, the suprarenals and the gonads.

The most important endocrine gland is doubtless the *thyroid*, the goiter gland. If its secretion is

normal the child properly grows, healthy teeth develop, mental activity is normal, and all of the glands of the body are made active by its normal secretion. If it overacts, which occurs more especially after puberty or later in life, the individual becomes very nervous, sleepless, loses weight, has rapid heart action, and the condition may develop into what is termed "exophthalmic goiter." If the secretion of the gland is absent early in childhood, the child is a "cretin"; he does not grow mentally or physically. If the secretion is only partially absent, the child does not normally grow either mentally or physically, has poor teeth, his skin is dry, he often adds weight, and he can not learn and will become a moron unless the condition is properly treated. If this diminished secretion of the thyroid occurs later in life the person puts on weight, becomes fat, sleepy, has a dry skin, is mentally sluggish, loses his hair and often his teeth, and unless treated develops the disease termed "myxedema."

The *parathyroids* consist of four little glands located at or near the thyroid or goiter gland. They are concerned with the metabolism of lime (calcium) which is very essential for normal health and for growth of the bones, teeth and nails. When the secretion is insufficient the bones become softened, as in rickets, the nails become brittle, and the teeth decay. Also when the secretion is not sufficient great nervous irritability occurs, and there may even be spasmodic contractions and convulsions. Insufficiency of calcium (lime) in the food interferes with the proper activity of these glands.

The *pituitary* gland is located just above and back of the nose, that is, above the region where adenoid tissue occurs in the upper part of the throat, the nasopharynx. It consists of two parts, the anterior and the posterior. The anterior portion takes active part in the development and growth of the body. If its secretion is insufficient, the child does not normally grow physically and is not active mentally. If it secretes more than is necessary for normal growth, the youth grows excessively and in rare instances becomes a giant. Subsecretion of the anterior portion of this gland in childhood causes short stature, and subsecretion of the posterior portion of the gland causes an extra amount of fat to be deposited, sometimes an excessive amount. The posterior portion of the pituitary takes an active part in the metabolism of starch and sugars, co-operating with the little glands, the "islands of Langerhans," in the pancreas. This posterior portion also furnishes a secretion that raises the blood pressure. If this gland is too active, the individual is likely to lose weight, and if it is insufficiently active fat is added and the person may become very obese. The pituitary and the thyroid have their activities correlated, and when one is disturbed the other is likely to be also disturbed. The posterior portion of the pituitary is closely associated with the normal functions of the matured female.

The *thymus* gland, located in the upper part of the chest just below the thyroid, is most active during young childhood and diminishes its activity at the time of puberty, and is generally inactive during

the rest of life. Its main purpose seems to be to correlate its secretion with the parathyroid and anterior pituitary glands and promote normal bone growth. It sometimes is too active, in which condition it is associated with over-activity of the lymph glands, and the child is fat, weak, flabby, easily acquires infection and disease, and has a rise in temperature from slight causes.

Each *suprarenal* gland consists of two parts, the external and the internal. The external part has one form of secretion and the internal part another form of secretion. The external part has to do with strength, muscular activity and general sturdiness and health, and especially is it essential for normal, sturdy manhood. The inner part of the gland has its more important activity in the production of a substance that increases the blood pressure. In diminished activity of the suprarenals the blood pressure is low, the patient is weak, often neurasthenic, and never has normal vitality. In the absence of the secretion of these glands anemia develops and the person can not live.

The function of the testicles is essential for normal manhood. The function of the ovaries is essential for normal womanhood.

Chapter II

Functions of the Body

It has been determined that the human adult of ordinary weight represents about ten gallons of water, twenty-four pounds of carbon, seven pounds of lime, one and eight-tenths pounds of phosphorus, one and eight-tenths ounces of salt (sodium chloride), one-quarter ounce of iron, one-fifth ounce of sugar, about ten ounces of other mineral matter including potassium, sulphur and magnesium, and a minute amount of iodine. The body tissues also contain nitrogen, oxygen and hydrogen.

Respiration.—A normal chest expansion for an adult male varies from two and a half to four inches at the nipple line. While two and a half inches is considered a rather small expansion, it has been found by careful investigation of many men that it may not show any lung or heart defect. Men breathe more abdominally, that is, through the activity of the diaphragm, than women, while women breathe more with the upper part of the chest. The measurement is best taken just above the breasts; the expansion is ordinarily less than in men. Women are learning to breathe more abdominally since they have become freed from the tight corset; but nature teaches them to breathe more with the upper part of the chest as during pregnancy abdominal breathing becomes impaired.

Shallow respiration is of very frequent occurrence. A large number of persons do not properly breathe; they do not properly expand their lungs. Children

in the schools, to-day, are taught how to breathe, therefore shallow breathing is less frequently found then formerly. It is health-giving for every adult to take deep breathing exercises either on arising or before going to bed. Good breathing benefits the circulation and improves the blood flow in the liver, which at all times contains a large amount of blood. This deep breathing also improves the abdominal circulation.

The *vital capacity* of an individual is the term used to signify the amount of air that he can inhale. This vital capacity is decreased by shallow breathing from long habit; by most any disease of the lungs, frequently tuberculosis; by heart disease; and by most any chronic disability. Partial or complete obstruction of the nose and nasopharynx (the upper vault of the throat) impairs the respiratory ability. Such individuals become more or less mouth breathers, especially on the least exertion. This obstruction is typically caused by polyps or deformities in the nose and by adenoids in the upper part of the throat. Children with these adenoids can not properly breathe and do not properly expand their lungs. With insufficient breathing through the nostrils the nose does not properly grow and the face becomes depressed. Abnormal conditions of the abdomen, as pain or some serious disturbance, impair the action of the diaphragm and the depth of respiration is decreased.

The stimulus to breathing starts in what is termed the respiratory center located in the *medulla oblongata*, which is the upper part of the spinal cord

before it joins the brain. Inspiration, the taking of air into the lungs, is caused by the automatic contraction of the intercostal muscles (the muscles between the ribs) and the contraction of the diaphragm which lowers it. These contractions cause the capacity of the lungs to be increased. The following expiration is caused by relaxation of these contractions.

The normal number of respirations per minute varies with the individual, with age, with health and with exercise. The normal adult breathes from fifteen to twenty times a minute. Some adults breathe more slowly, but above twenty when at rest is an abnormal frequency. When the frequency becomes above twenty-five times a minute the depth of inspiration is decreased, and when the inspirations are more than thirty a minute there is what is termed "*dyspnea*," that is, shortness of breath or air hunger. Rapid breathing is not abnormal after severe exertion if that exertion is prolonged, and is Nature's method of increasing the intake of air into the lungs for the purpose of adding more oxygen to the blood which is being utilized in larger amount by the muscles to sustain the exertion. In other words, the more the exertion the more the oxygen that is used and the more the carbonic acid that is formed by the various activities of the body, especially the muscles. If rapid breathing occurs when the individual is at rest, some serious condition is causing it, and medical investigation is a necessity.

A frequent cause of rapid breathing on the least exertion is anemia, and anemia means a diminished

number of red corpuscles, or a diminished amount of the iron constituent, hemoglobin, in the red corpuscles, or a diminution of both red corpuscles and hemoglobin.

It is the iron constituent of the blood that changes the carbon dioxide (carbonic acid) of the blood to oxygen, the exchange occurring in the lungs. In conditions of anemia the more rapid breathing is Nature's method of securing enough of this exchange of carbon dioxide for oxygen in the same length of time that it occurs with normal blood and normal breathing. At high altitudes where the air is rare and the air pressure is diminished the oxygen exchange is less rapid, therefore at these altitudes one must breathe more rapidly for comfort. After remaining a time at this altitude one becomes used to the rarefication of the air and his breathing becomes of normal frequency. For a time, at least, at these altitudes the blood shows an increase in the number of the red corpuscles, which facilitates this oxygen exchange.

Arterial blood is scarlet because it contains the greatest amount of oxygen and the least amount of carbon dioxide. Venous blood is darker and of a crimson color because it contains the least oxygen and the most carbon dioxide. This exchange from one color to the other occurs in the smallest air passages of the lungs, where the blood is in small vessels with only a thin membrane separating it from the air in the lungs. In these terminal endings of the bronchial tubes and air passages is where the exchange of these two gasses takes place, namely,

the blood gives carbon dioxide to the air and takes oxygen from the air. The next expiration eliminates this carbon dioxide from the lungs and the next inspiration takes in more oxygen, and this process continues throughout life.

Circulation.—The heart is a muscular organ, a pumping apparatus, that on the average weighs about ten ounces. It is located in the center of the anterior part of the chest, a little more to the left side than to the right, and is more or less pyramidal in shape with the apex pointing downwards to the left. The apex is located in the fifth interspace between the ribs, and when the heart contracts this apex throbs, and its beat can generally be felt, and sometimes seen, about three or three and a half inches to the left of a line running down the middle of the sternal bone at this level, namely, between the fifth and sixth ribs. If the apex of the heart changes its position either downwards or to the left, the heart is stated to be enlarged. Many things may cause such enlargement.

The heart beats on an average about seventy-two times a minute. However, in adults it may contract normally from sixty to eighty-four or even eighty-eight times a minute. Anything over ninety is abnormally fast, and anything below sixty is abnormally slow. Children's hearts beat faster than those of adults. The beat of the heart is felt in the arteries, and is generally counted in the radial artery as the "pulse" at the wrist.

This muscular pump, the heart, is divided into two halves with two cavities in each half. The

right side of the heart has two compartments termed the right auricle and the right ventricle. The right auricle receives the blood that is returning to the chest through the large veins of the body. This is venous blood, which means that it is loaded with carbon dioxide. This blood entering this auricle passes through an orifice into the right ventricle. This orifice is protected by a valve termed the tricuspid, which means three cusps or flaps. When the right ventricle contracts this valve is closed and the blood is forced into the pulmonary artery and circulates through the lungs where it is changed from venous to arterial, that is, loses its carbon dioxide, takes up oxygen and becomes scarlet in color. This blood then returns from the lungs through the pulmonary veins and enters the left side of the heart, which is also divided into an auricle and a ventricle. The blood entering the left auricle passes through an orifice into the left ventricle. At this orifice is a valve termed the mitral valve which has two cusps. Following the contraction of the auricle is the contraction of the ventricle, which closes this valve and sends the blood coursing through an orifice into the large blood vessel called the aorta. After the contraction of the left ventricle the blood is forced rapidly through the whole arterial system; the back flow in the aorta closes the aortic valve which prevents the blood from flowing back into the heart. This blood goes all through the arteries of the body and heart, distributing its life-giving oxygen and taking up carbon dioxide, to be again returned to the right side of the heart as venous blood. Each

beat of the heart consists of the contraction of the auricles together and the immediately following contraction of the ventricles together. The apex beat is due to the contraction of the left ventricle. The ability of the heart, which is not much more than the size of one's fist, to work is considered by physiologists to be equal to the lifting of about a hundred and twenty-four tons one foot high every twenty-four hours. Each contraction of the heart must have sufficient force to send the blood from the heart through the distal circulation, as the feet, and back again into the heart. This represents a power sufficient to raise a pound of water four or five feet.

Part of the circulatory efficiency and ability is located in the arteries of the body. These arteries normally relax to receive blood and contract to push it forward through the different parts of the body, to be returned through the veins. Therefore healthy arteries, that is, normally elastic arteries, are essential for perfect circulation. If these arteries lose their elasticity by becoming hardened, a condition termed arteriosclerosis, their ability to help the circulation is impaired. Another help for the return of the blood through the veins to the lungs is by inspiration causing what is termed a negative pressure in the lungs compared with the atmospheric pressure on the rest of the body. The blood is thus hastened into the lungs during each inspiration, another reason that normal breathing is essential.

If the bulk of the blood is abnormally low, the blood vessels of the body can not be properly filled and they can not well help with their normal elas-

ticity. In other words, they must be full to well contract, one cause of the seriousness of hemorrhage and of great loss of water from the body. On the other hand, if the arteries of the body become narrowed or otherwise obstructed, or the smaller terminal arteries or capillaries become contracted for any reason, the force required by the heart to push the blood through the arteries in these conditions is increased and the blood pressure from these two conditions is raised, and we have what is termed high blood pressure or "hypertension."

Blood Pressure.—By blood pressure is meant the tension at which the blood is propelled through the arteries, and this tension depends upon the force and strength of the heart contractions, the health of the arteries (that is, their elasticity), the resistance to the blood flow in the terminal vessels and the volume and viscosity (thickness) of the blood. The blood pressure was not frequently noted up to about twenty-five years ago. Since that time it is constantly taken as offering one of the indications of the condition of the individual. It is required by most insurance companies in their medical examinations. Before blood pressure instruments were used the pressure was estimated by the physician by the "feel" of the tensity of the pulse and the softness or hardness of the artery under examination.

Blood pressure has become almost a fetish among laymen. They are more anxious to know what their blood pressure is than about any other of their physiologic functions. Too much importance is placed by them on the blood pressure reading.

The normal blood pressure for any one individual is variable, as variable as is the normal pulse. Two readings of the blood pressure are taken, one the systolic, which means the highest pressure, the other the diastolic, which means the lowest pressure read on the instrument by the aid of the stethoscope. The difference between these two, the high pressure and the low pressure, is termed the pulse pressure. The upper or systolic pressure may be roughly stated for normal young adults as about 120 millimeters of mercury pressure, while the diastolic is about 80 or 85 millimeters, the normal pulse pressure being not far from 30 millimeters. The systolic pressure may be 130 or a little over and still be perfectly normal, while the diastolic pressure may be 90 or 95 and still be normal. In older persons and in athletes the systolic pressure may be as high as 140 or 150, and the diastolic may be about 100. A person may be perfectly well as far as he knows and still have a pressure as high as 180 or more. If the diastolic pressure is much over 100, it is a subject for medical consideration. Any individual with what the physician may term a high pressure requires careful study as to its cause, and very frequently some treatment of his condition is needed.

Children's blood pressures are always low, and many well adults have what is termed subnormal blood pressure with a systolic from 100 to 110, and yet they may be perfectly well and able to do their work. If the blood pressure becomes too low the person becomes weak and is easily tired. The cause for subnormal blood pressure should be studied by

a physician. If it is normal for the individual, nothing need be done. A prolonged high pressure causes a strain on the heart, as it is evident that it must do very much harder work with a high pressure than with a normal pressure.

Blood.—The amount of blood in a human being varies with the weight. Approximately, a normal adult weighing 150 pounds will have between five and six quarts of blood. The amount of blood estimated by the individual weight of course must depend upon the amount of fat that he carries. An obese person should not have his blood estimated by his weight, as he has much less blood than an estimate from his weight will show.

Most adults who are well and strong can stand the loss of a pint of blood without much discomfort, provided they remain at rest for a number of hours after the hemorrhage or the withdrawal of this amount. Some normal adults well stand the loss of nearly a quart of blood, when withdrawn for transfusion purposes. Hemorrhage from disease is always more or less serious, and even a small loss of blood may cause great weakness.

The blood consists of red and white cells and the *plasma*, which is the fluid in which these cells are suspended. The normal adult male should have about five million red cells per cubic millimeter (1/25 of an inch), while women normally have less, namely, about four million five hundred thousand. The number of the red cells of the entire body has been estimated at about twenty-five trillions. It is these cells that change their color with the exchange

of carbon dioxide for oxygen rendering the blood crimson when they are carrying carbon dioxide and scarlet when they are carrying oxygen.

The normal number of white cells per cubic millimeter is about eight thousand. More than nine thousand or less than six thousand is abnormal, and when very low or much higher there is generally some disease. It has been estimated that there are about thirty billion white cells in the body. Many of the acute infections cause an increase in the number of white corpuscles, and in some blood diseases the number is tremendously increased.

The white corpuscles are divided into several types, one of the most important of which is what is termed the "polynuclear," which have several nuclei. These cells take a large part in fighting infections, especially the septic infections. The other principal types of white blood cells are termed "lymphocytes," the "large" and the "small." The small cells are principally concerned in carrying nutrition to the different parts of the body. Normally about seventy-five per cent. of the white cells are of the polynuclear variety, while the other twenty-five per cent. represents the other types of white cells. Anemia may be caused by a diminution of the number of red cells or by a diminished amount of hemoglobin, that is, the iron-containing element of the red cells.

The plasma contains many ingredients, roughly estimated, perhaps, as a small teaspoonful of sugar, a tablespoonful of salt, and various other minerals.

The blood carries the elements for nutrition and

the products of waste for excretion. From the intestines and the different glands of the body, especially the endocrine glands, it picks up the nutritive and chemical elements, and from the muscles, brain and organs of the body the products of work and waste. The blood becomes purified of its waste products principally by passing through the kidneys. When the blood passes through the liver it loses some of its pigments and receives some necessary elements for nutrition.

WATER.—About 60 per cent. of the body weight consists of water, and digestion can not take place, and the tissues become impaired in their functions, if water is not daily supplied in an amount that equals the daily loss from the body. If the loss exceeds the intake, we lose weight. If the intake exceeds the daily loss, we gain weight, but often not a healthy type of weight. Very little water is absorbed from the stomach; it is mostly absorbed from the small and large intestines. It should be recognized that much water is taken with foods as well as when drunk as such, as many vegetables and fruits contain large amounts of water. Even potatoes and bananas are 75 per cent. water.

According to Rowntree,[1] a man of average size secretes three pints of saliva a day, two to three quarts of gastric juice, from two-thirds to one pint of bile, from one to one and a half pints of pancreatic juice, and three quarts of intestinal juice. Therefore, the amount of fluid thus entering the intestine daily is from seven and a half to ten quarts, that is, from

[1] Rowntree; Physiological Reviews, Jan. 1922, p. 116.

two to three times the amount of fluid ordinarily ingested by mouth and from three to four times the amount ordinarily excreted as urine, or about twice as much as the total volume of the blood. As the fluid passes downward there is re-absorption, and the amount remaining in the feces is considerably less than half a pint per day.

The water in the body readily moves from place to place, if any part of the body needs it. There may be water deposited abnormally in the tissues. In small amounts this is called *edema;* in large amounts it is called *dropsy*. Serious impairment of the circulation, unless properly treated, will cause these edemas, and if the impairment of the circulation is very serious, dropsy occurs. Serious impairment of the kidney functions will cause it, and some diseases of the liver will cause certain types of dropsy; especially is fluid likely to occur in the abdomen.

On the other hand, excessive loss of water, as occurs in diabetes, in diarrhea and in prolonged vomiting, deprives the tissues of necessary fluid and serious symptoms occur. From privation of water the tissues shrink, digestion can not properly take place, and the skin and kidney excretions are impaired. The bulk of the blood may be so diminished that disturbance of the nervous system occurs, evidenced by excessive nervousness, sleeplessness, headache, and even fever. Infants and children often do not receive a sufficient amount of water, and especially do they not when they have acute diarrhea, and they may die from lack of water. In diabetes, which is now so frequent a disease, the water ingested

each twenty-four hours must be sufficient to equal the amount lost in that length of time.

In obesity and in dropsy the amount of water that is allowed should be less than the amount lost each day, but great privation of water, even in these conditions, is not safe. In either of these conditions the physician should not only arrange the proper diet, but also must decide the amount of liquid that should be taken.

It is not safe for an obese individual to attempt to deprive himself of water without a physician's orders. It is also not advisable for so-called health articles to state that so many glasses of water must be taken, daily, by every individual. Such amounts may do harm. Also, it is generally unwise for one who must rise at night to urinate to drink much water before retiring. In other words, many of these health rules are inappropriate in a given case.

Water is mostly stored in the muscles and skin, and in the need of the other tissues of the body, especially the digestion and the blood, for more water, this surplus is drawn upon as a reservoir. The blood must retain its normal amount of water, otherwise serious symptoms occur.

Excessive perspiration causes weakness and, also, is serious from the loss of liquid. Such conditions require consultation with and study by a physician, as there often is some cause that should be treated, especially when such perspiration occurs at night. Some of the faintness caused by the action of strong cathartics is due to the sudden loss of water from the intestines and blood. When one is exposed to severe

heat and perspires profusely he needs constantly to take water in some form. In such conditions iced water should not be drunk, except very slowly. It is dangerous to rapidly swallow very cold water, especially when one is over-heated.

Part of the terrible thirst and prostration caused by profuse hemorrhage is due to the loss of water. In such conditions life may be saved by the proper administration of liquid, often by injections of salt solutions or blood (*transfusion*) into the veins. When large amounts of water are lost to the body the blood pressure becomes low and the kidneys can not act. Consequently, the waste products of the blood which are generally excreted in the urine are not so excreted and poisoning of the body occurs.

If too much water is lost from the body, or it is deprived of water, fever develops, perhaps because there is less evaporation from insensible perspiration. It is not infrequent for a very young child to develop fever because he has not had sufficient water. In certain conditions of the kidneys salt (sodium chloride) may not be properly excreted. This causes retention of water in the body and consequent swellings or dropsies. Even when large amounts of water are drunk Rowntree believes it is difficult to cause a dilution of the blood, although with privation of water the blood becomes thicker, that is, has its viscosity increased. There is no question but that in all fever conditions plenty of water should be given.

In fever, if the skin is dry, normal perspiration can not take place and the temperature rises from this

cause alone. Therefore, it is necessary in these conditions in some way, by sponging of the body with tepid water or by the administration of some drug, to cause perspiration, and the temperature will be immediately lowered. In certain diseases of the skin which cause it to be very dry, the person's health becomes abnormal and more work is thrown upon the kidneys. There is always an interaction between the kidneys and the skin. If one function is not well working the other tries to do extra work, especially in the excretion of water. This is the reason that, in hot weather when the skin secretes excessively, the amount of urine is diminished, and in cold weather when the skin secretes but little the kidneys secrete more. Certain diseases that affect the skin, such as scarlet fever, cause an inhibition of normal perspiration, and the complication of kidney trouble is well known in this disease.

In certain conditions of shock from injury or collapse, the heart action is weak, the blood vessels become dilated and water passes into the tissues. The blood in shock may become impoverished of water and need extra liquid to aid the patient to recover. On the other hand, it has been shown that a condition of water intoxication may occur, when much more water is taken than can be, or is, excreted, and disturbing symptoms may occur from this cause alone. It is thus seen that the action of water on the system is not as simple as has been so long believed.

A certain amount of water must be drunk with meals, to make digestion more rapidly complete and

not to deprive the tissues of water. The digestive system must have water, and, if it is not given to it, it must take it from the tissues.

Anemic patients are inclined to drink more water than they need, therefore water should be restricted while the proper diet and medicinal treatments are improving the condition.

All natural waters give to the body more salts and minerals, but to be what is termed a "potable water," it should not contain large amounts of mineral matter, and to be pleasant it must contain oxygen. Boiled water has its oxygen and air eliminated, and of course is free of all germs, but retains its salts. Distilled water does not contain any mineral matter, therefore it is the most ready to cause the solution of soluble salts in the body and to aid in their passing out of the body. In any case where there are gall-stones, kidney stones or gravel, or when renal (kidney) or gall-stone colics have occurred, distilled water is more beneficial than ordinary waters that contain minerals. It should, however, be noted that no water, or lithia or other spring water, can dissolve gall-stones or kidney stones, but distilled water is the most efficient in preventing the deposit of more concretions.

Excretion

ELIMINATION.—We have four different methods of excretion or elimination of used products of nutrition and metabolism, namely, the lungs, the kidneys, the bowels and the skin. Each one has an important bearing on health, and without the proper

activity of each one health can not be maintained. The *lungs* excrete carbon dioxide and moisture (water) principally. This moisture is very evident on cold days, when it congeals into vapor. Various food and drug odors are excreted by the lungs, but they are not of much importance and represent temporary conditions. In certain diseases the breath may have characteristic odors; in serious diabetes the odor is sweetish, due to what is termed *acetone*. In serious kidney disease there are frequently disagreeable odors in the breath. Some lung conditions may give very fetid breath odors, and especially frequent are noxious odors due to infected gums and infected tonsils, or due to certain kinds of nose and throat catarrh. Persons in otherwise good health rarely have an excuse for the perpetuation of a bad odor in the breath. There is always a cause that can generally be removed. Perhaps the most frequent cause is cheesy matter occurring in the crypts of the tonsils.

The *kidneys* excrete by means of the urine large amounts of water, various mineral salts, and, most important, the waste products from metabolism, mostly nitrogenous products and some acids. In abnormal conditions they excrete some ammonium salts.

The kidneys excrete, in the normal adult, from one to two quarts of urine in twenty-four hours. Much less than one quart is not normal and much more than two quarts is not normal, if such amounts are continuous and not incidental. Normally, more urine is excreted in winter than in summer, unless

the person is housed and warm. This is because there is less sweating. In summer when the perspiration is more profuse and evaporation of water from the body and breath is greater, unless large quantities of liquid are taken, the amount of urine is diminished.

The frequency of urination varies with the individual and also varies with the time of day. Generally, more urine is passed in the morning hours than in the afternoon and evening hours, frequently due to the coffee that is generally drunk in the morning. The caffeine of coffee and tea acts as a kidney stimulant. Anything that raises one's blood pressure will increase the amount of urine excreted, and the reverse, anything that lowers blood pressure will decrease the amount of urine passed. Sudden chilling, therefore, increases the amount of urine, and overheating decreases it. The frequency of urination varies; normally it occurs once in three to once in six hours. When one must urinate every hour it is too frequent, and every half hour calls for investigation as to the cause. Of course, the amount of urine passed depends upon the amount of liquid ingested. If large amounts of fluid are taken, large amounts will be passed, when the individual is normal. Arising once at night to urinate may not be considered abnormal and is a habit; arising more than once, if persisted in, should call for some investigation as to the cause. A frequent cause is that too much liquid is drunk before going to bed. Children who spend many hours in bed must urinate during the night.

The urine normally should be straw-colored, clear, acid and have an aromatic odor. If it is very pale and persists in being pale when large amounts of liquid are not taken, it is wise to have the urine examined. A very dark urine may occur because it is concentrated, or the high color may be due to bile or to blood. Bile and blood in the urine are abnormal. If the urine is cloudy as soon as passed, it may be due to a deposit of phosphates. Such a condition is not abnormal, if it occurs soon after a meal. If such cloudiness persists, however, throughout the day and for several days it is not harmless and calls for treatment. If a flocculent substance is seen in the urine, it probably is mucus and is generally not serious, unless in considerable amount. If on standing a white sediment is deposited, it may be pus and should be investigated. Such pus may come from the bladder or from a kidney, or in certain diseases from the urethra. In any case such pusy sediment calls for a urinary and a general examination. If a sediment occurs in the urine after it has become cold, especially in cold weather and especially if the urine is concentrated, it may be simply a deposit of urates, and is perfectly harmless. It often indicates that not sufficient water is drunk. If the urine is irritant and deposits what looks like brickdust, it means that there is an excess of uric acid, and that the diet is wrong. If the urine has a very bad odor not due to asparagus or onions, or if it smells ammoniacal, and such a condition is persistent, it must be investigated.

As a general working rule for the promotion of

health, adults should have a yearly physical examination, which of course includes examination of the urine. After fifty years of age it is well to have an examination once in six months, even if one feels perfectly well. It is of but little general value to send a specimen of urine to some examining place without having a physical examination. It is only one part, though an important one, of the general examination. Also it should be noted that very many times *one* examination of the urine is unimportant; severals examinations may be required, which may show that an abnormality was a pure incident. On the other hand, serious disease of the kidneys may be developing, or may have developed, and the urine at one examination be found perfectly normal. There may even be an abscess of the kidney and yet the pus be passed into the urine only intermittently. All of this is stated to urge that everyone should undergo a physical examination at least once a year, and the questions the physician asks may be as important as the physical examination itself.

Skin.—A very important organ of excretion is the skin. Its principal function is its insensible perspiration, which means that moisture is more or less excreted and heat is lost by radiation and evaporation. There is an interchange of function between the skin and the kidneys. If the kidneys excrete excessively, frequently the skin is less moist or is dry. On the other hand, if the kidney function is decreased, the skin function increases, at least for a time. Also the opposite, if the skin becomes dry, harsh, inflamed as in scarlet fever and eczema, or

is injured as by burns, more work seems to be thrown upon the kidneys, and if the skin inactivity is permanent, the kidneys sooner or later become diseased.

Sodium chloride is also excreted by the skin, and sometimes pigments, as especially occur in jaundice and many liver disturbances, are excreted by the skin. In disease of the kidneys some small amounts of nitrogen waste may be excreted. Some diseases of the glands, especially of the thyroid (the goiter gland) cause disturbance of the skin excretion, and the skin activity is greatly diminished when the thyroid is much subsecreting. A healthy skin is soft and velvety, not necessarily moist.

A proper amount of water in the tissues is necessary for normal perspiration and evaporation and for keeping the body at the normal temperature. Ordinarily, with an atmosphere of 98°F. or more evident sweating is caused, else heat stroke is likely to occur. On exercise, especially in warm weather or when there is excessive heat, more or less profuse perspiration occurs, the evident perspiration as contrasted with the insensible perspiration. This profuse perspiration is called sweating, and tends to decrease the heat of the body and prevent over-heating. In certain diseased conditions and in great weakness, and frequently after high fever, profuse sweating occurs. If this excessive sweating persists, it shows great weakness, and the patient is debilitated by it.

Perspiration may so increase that an individual may lose a quart of sweat in an hour, and many quarts of water may be evaporated from the body during a ride in the dry heat and hot sun. The

sweat is almost 100 per cent water, and is acid in reaction. It has been estimated that a square centimeter (about three-eighths inch square) of the skin may contain, depending upon the part of the body, from 500 to 1900 sweat glands.

Various pigmentations occur on the skin, varying with different individuals. Some freckle readily, and others burn readily, and some diseases cause pigmentation of the skin. Excessive exposure to the sun, or exposure to the ultraviolet ray, which is so much used at the present time for different diseases, may cause serious consequences. The ultraviolet ray should never be applied, except when caused by the sun's rays, without medical supervision. Ordinary exposure of the body to the sun's rays is of benefit and healthful; excessive exposure may do harm.

Sleep

Sleep is a necessity for human life and health. The amount of sleep that is needed in any individual case varies, one person requiring nine to ten hours out of twenty-four and another only six or seven hours. Eight hours is the average, and should be sufficient for an adult under all ordinary circumstances. Seven hours of sleep is very frequently all that an individual obtains, and is generally satisfactory.

If anyone is drowsy during the daytime, there is some cause. The obese are often sleepy, and those who are anemic and those who have poor circulation are sleepy. Over-eating causes drowsiness. Insufficient secretion from the thyroid gland causes sleepiness. Consequently, the cause for the abnormal desire

to sleep should be sought and properly treated. Too much sleep is not of benefit to anyone; in fact, it is depressing. For those who are otherwise well, sleeping after the normal time for rising in the morning is not healthful.

The early hours of sleep seem to be the most restful and the time that the sleep is the most profound, the person being less easily aroused by external noises or irritation at that time. Profound sleep has been found by investigation to be intermittent. The person moves and turns, although he may not really awake.

During sleep the heart beats less frequently, the blood pressure falls, digestion is slowed, and the ordinary muscle activities are in abeyance, except those concerned with breathing and the circulation. It has been much discussed, lately, as to whether or not the brain needs much sleep. However much of a scientific question this may be, practically it is a fact that the brain can not work continuously without rest, and if artificial means are taken to keep an individual awake, as by coffee or some other means, the future tire becomes cumulative and finally brain fatigue develops, with all the symptoms of nervousness, restlessness and finally inability to sleep. On the other hand, prolonged activity without sleep for forty-eight or more hours may cause one to almost drop in his tracks and sleep so profoundly as to be very difficult to awaken.

The best mental work is generally done in the morning hours. However, some brains do not really wake up until later in the day when an equilibrium

is established of the circulation, digestion and nutrition, and the best work may then be done in the afternoon. Without the proper amount of sleep the muscles do not as well coordinate, and accurate movements in occupations and delicate movements in scientific investigations are best made a few hours after a good sleep.

It has been a question of much investigation as to what it is that causes the individual to desire to sleep, or what it is that produces sleep. It would seem as though the most prominent cause was the action of fatigue substances, that is, the waste substances of muscle and brain activities circulating in the blood. These cause a soporific effect on the brain and a desire for sleep, and if the patient goes to bed sleep is the outcome. When the patient goes to sleep normally the circulation of the brain is diminished. This is caused by the cessation of mental activity, and any part of the body that is inactive requires less blood. Also, this lessened circulation of the brain is caused by the lowered blood pressure and the slower action of the heart. This partial anemia of the brain is probably another factor in causing sleep. It is also quite probable that there are actual changes in the brain cells that take part in the production of sleep.

If the brain remains active after the person goes to bed, it may be hours before he can sleep. If he has the ability to shut out his thoughts of the day's work, or to-morrow's work, or the troubles of human life, and to dissociate himself from the rest of the world, he quickly goes to sleep.

Habit forms another factor in causing sleep, and this habit is encouraged by the normal time for sleep being the night, when the activating and stimulating influence of the sun is in abeyance. The old-fashioned sleep time has been diminished by the increase of lights in all civilized communities. In other words, darkness suggests sleep and light suggests wakefulness. The person who works at night and sleeps in the daytime never rests as well. He may learn to acquire a habit of sleeping in the daytime with his room darkened, but it seems to be an abnormal time for good sound, restful sleep.

Anything that disturbs the individual mentally or physically may prevent sleep. Of course one can not sleep when suffering pain, and not well when there is indigestion. Correction of the diet and the removal of whatever may be the cause of the indigestion will allow sleep to normally occur. Very frequently coffee or tea taken at the evening meal is the cause of the difficulty in getting to sleep. Some persons have an idiosyncrasy against the caffeine in these beverages, which is a brain and circulatory stimulant. Normally, a large number of individuals after forty find that coffee and tea, which may have never before affected them, begin to cause wakefulness. Some persons may not be able to take coffee or tea at the noon meal without being wakeful the following night. Under no circumstances, unless it is given as a medicine, should coffee or tea be given to young children. At the present day children are nervous and high strung even without this abnormal stimulation.

The younger the child the more sleep is needed, but it is a mistake to make a child of over five years go to bed too early. He lies awake and becomes restless, or else he wakes too early in the morning and wants to get up before the household is ready to arise. In the city the disturbing noises of traffic, radios and bright electric lights makes the sleep, even of children, less sound. "Daylight saving time" is a hardship for young children on account of the extra daylight on going to bed and the extra early morning traffic. Change from standard to daylight saving time is an unnecessary hardship for many classes of people.

A very frequent cause of sleeplessness is eyestrain, and eyestrain occurs when glasses are needed, when they are incorrect, and when they are mal-adjusted. Eyestrain with or without headache may cause more or less wakefulness.

It is not necessary to discuss the many diseases or abnormal conditions that cause insomnia. Prolonged wakefulness should induce the individual to seek medical advice.

Many simple methods of causing sleep may be tried. As just stated, coffee and tea should be omitted from the evening meal and also any food that is known to cause indigestion. Constipation should be avoided. Eyestrain should be prevented. Noises should be shut out as far as possible. The room should be cool and should have sufficient fresh air. This does not mean that, as a fad, as many windows should be open in the winter season as in the summer season, unless the room is much over-heated in the

winter, and over-heating at night should be avoided. Sometimes a cup of malted milk taken at bedtime, or some simple food eaten before retiring will cause restfulness and sleep.

So-called hypnotic drugs should never be taken without the advice of a physician. Most of these medicines lead to the formation of drug habits. Self-medication is almost never advisable, and to believe that some popular hypnotic is harmless is a mistake. There is no such thing as a perfectly harmless sleep-producing drug. The much used aspirin for all kinds of aches, pains, colds and headaches is more or less of a heart depressant and should not be often taken. It is not a harmless drug, and any advertisement that states that it is harmless does not tell the truth. No one of the coal-tar drugs, such as acetanilid, phenacetin, or any other of that class can be termed harmless. Although many drugs when properly administered do no harm but do good, when used without the advice of a physician may be harmful, as the layman does not know on what part of the body these drugs act, and he may have some insidious disease that would make the drug he uses injurious.

A frequent cause of sleeplessness is irritation of the skin, especially in infants and young children. Being clothed too warmly at night, an irritating perspiration, some disease that produces itching, or itching caused by the bites of insects may be causes of enough discomfort to prevent sleep. Therefore it is evident that any condition of sleeplessness that persists should be carefully investigated as to its exact cause.

Chapter III
Nutrition

Digestion.—Food and drink are first swallowed into the gullet or esophagus (which in the adult is about ten inches in length), passes into the stomach, and is there partially digested. It then passes into the upper part of the small intestine (*duodenum*) and there is mixed with the digestive secretions of the intestine and of the pancreas, and the bile from the liver and gall-bladder.

As the digested parts of the food pass along through the small intestine, which is about twenty-four feet in length, the nutritious portions are absorbed into the lymphatic vessels and blood and are distributed throughout the body. The refuse of the food is then passed into the large intestine, the colon, at the right of the abdomen in the region of the appendix. The *colon* is divided into three parts, the ascending, on the right side of the abdomen, the transverse, which goes across the upper part of the abdomen, and the descending, which goes downward on the left side of the abdomen. During this passage the water, which accompanies the food waste, is more or less absorbed and the residue becomes fecal matter in the lower part of the descending colon, and from there passes into the rectum for evacuation.

One or two movements of the bowels a day seems to be the best for normal health. The subject of constipation is discussed elsewhere.

The secretions taking part in the digestion of foods

are the saliva, the gastric juice, the pancreatic secretion, the intestinal juices, and the bile. Very little nutriment or liquid is absorbed from the stomach; even water is not much there absorbed. Absorption of the elements of nutrition takes place in the small intestine; the residue passes off as refuse. These nutriments are largely absorbed by the lymphatic vessels and partly by the blood vessels of the intestine.

The saliva comes mostly from the parotid glands and in smaller portions from other glands adjacent to the mouth. This secretion, with the mucous secretion of the mouth and throat especially after chewing, smoothes and moistens the food ready for swallowing. The digestive part of the secretion acts on the carbohydrates (starches) to form sugars, and sugar is the form in which the valuable part of carbohydrates is absorbed.

The stomach juice consists principally of a very dilute hydrochloric acid and pepsin. The starch digestion in the stomach from the saliva is continued until the stomach contents become acid, which will vary from one to two hours. The stomach digestion is aimed entirely at the proteins, that means meats and other protein foods. In two and a half to three hours, unless digestion is delayed, the partially digested food is passed in small portions at a time into the duodenum, the first part of the small intestine. Here the acid mixture of the food and stomach secretions meets the juices of the intestine and the pancreatic secretion, and becomes alkaline by the action of the bile.

The pancreatic secretion digests both starches and proteins. The digestion of the proteins and carbohydrates is sooner or later completed and the food is passed down through the small intestine, with the digestive process proceeding and absorption taking place.

The activity of the bile is largely for the digestion of fats, and fats can not be properly digested without the action of bile. Therefore, if anything interferes with the production of bile or its passage into the intestine, intestinal indigestion occurs, and fats should be withdrawn from the food.

Many drugs, some foods and drinks, large amounts of sugar, much candy and a large amount of fats and oils all slow digestion. Alkalies, as sodium bicarbonate, taken directly after a meal slow digestion. Ice-water slows digestion. Water at an ordinary temperature, unless in large amount, does not slow digestion but may stimulate it. It does not decrease the acid of the stomach and may actually increase it. Too much water, however, should not be taken with meals; the best time to take water is between meals.

Large amounts of water are required for all of these digestive processes, and quarts of water are required for the perfect secretions and activities of these different digestive fluids. It has been estimated that at least eight quarts of water pass through these secretions twice in twenty-four hours. A large part of this water is re-absorbed and re-utilized, consequently, it is not necessary to daily take very large amounts of water. The amount that

need be ingested depends upon the amount excreted by the kidneys, skin and lungs. Everyone should drink plenty of water, but it is not necessary to drink enormous amounts as is so frequently advocated.

When water is taken into an empty stomach it is generally rapidly passed into the intestines. Therefore, if impure water is drunk it is more dangerous when taken between meals than with meals, as when taken with meals it remains longer in the stomach and is acted upon by the hydrochloric acid of the stomach, which kills most bacteria. When an infected water is rapidly passed through the stomach into the intestines the alkaline reaction of the intestines tends to allow most bacteria to grow. Therefore it is very unwise for trampers or campers or those who are motoring through the country to stop anywhere for a drink of water, which may be contaminated with typhoid fever or other germs. On such trips one should drink water procured from a city supply, which is now generally pure, and carried in thermos bottles; or one should drink one of the bottled waters; or the water should be boiled. Even those who are protected from typhoid fever by typhoid inoculations should, nevertheless, be careful not to drink polluted water.

Hunger seems to be caused by contractions of the empty stomach; contractions of the stomach during digestion are normal. Appetite depends upon many conditions, largely on the normal senses of taste and smell. Pain, especially headache; any mental disturbance, as sorrow, worry, fretting or

temper; and even disturbing conversation can prevent appetite. Food that is unpleasant to look at or has a bad odor will stop appetite. During starvation the stomach contracts, causing hunger pangs which disappear in a few days, and the final starvation process may not cause the suffering that one would expect.

Alcohol will stop hunger, and, in small amount, is a food and will postpone starvation. Alcohol between meals prevents the normal appetite, and much alcohol with meals interferes with digestion. Most any form of alcohol, in a perfectly normal individual, taken with meals may increase the appetite, and, if the digestion is good, it tends to cause the person to put on weight. Sooner or later his tissues are damaged by the alcohol and permanent harm is done by such continued use. Smoking inhibits hunger, and one who over-smokes can generally be discovered by the fact that he smokes just before his meals.

Suffering from thirst is constant and persistent until the thirst is satisfied. The first sensation of thirst undoubtedly occurs from the drying of the mucous membrane of the mouth and throat. The salivary glands quickly feel the need for water, as the saliva is about ninety-eight per cent. water.

Coffee and tea in large amounts will interfere with digestion. In small amounts they stimulate digestion, especially the aromatic oils of coffee. The caffeine contained in these preparations stimulates the secretions and the muscle activity of the stomach and intestines. Excessive amounts of caffeine,

whether taken in coffee or tea or in any other form, are harmful. Most of the aromatic vegetables as well as spices, are stimulant to the gastric secretion. Large amounts of spices slow digestion. As above stated, pain in any form, especially headache, inhibits gastric digestion and indigestion is caused.

A frequent condition is hyperacidity (an increased amount of acid) of the stomach, due to very many causes; on the other hand a not infrequent condition is a diminished secretion of the hydrochloric acid of the stomach. Indigestion is evidenced by distress, large amounts of gas eructated, and sometimes water-brash, that is, sour liquid eructated. If there is pain or nausea or vomiting, one should immediately seek medical care.

Many persons take sodium bicarbonate more or less frequently for these indigestions. While such treatment is frequently harmless, it tends to interfere with the normal gastric secretion and plays with the cause of the digestion rather than treats the cause. A person requiring such treatment frequently should seek advice from his physician. The causes of indigestion are eating wrong food; eating food not properly prepared; eating too rapidly; having meals at irregular hours; eating when too tired or when suffering from eyestrain and eyestrain headaches; and many other causes that may need investigation.

Ordinarily we should not "sense" our stomachs any more than we should "sense" our heart-beats. We should not note the stomach contractions which are normal for digestion. If the mucous membrane of the stomach is repeatedly irritated by some irritant

food, or has, which is very frequent, developed some slight ulceration similar to a canker sore in the mouth, it becomes extra sensitive and may finally develop a real ulcer, or the mucous membrane may become inflamed. Therefore the greater reason that a physician's advice should be sought when indigestion in any form occurs and persists. At any time over-distention of the stomach will be sensed by pressure on other organs.

Persistent loss of appetite or a persistently coated tongue should cause an investigation; there is always a reason, although that reason may be very simple and easily overcome. One of the earliest symptoms of beginning tuberculosis is loss of appetite and indigestion. All acute diseases start with loss of appetite, often indigestion and sometimes vomiting. Heart disturbances and either mental or physical tire may cause loss of appetite and poor digestion of even simple foods.

It must be repeatedly emphasized that eyestrain is a frequent cause of stomach symptoms, even without headache. The person may need glasses for his near work, or for distance, or for both. The *correct* glasses, obtained from an oculist, to overcome the defects must be *correctly* fitted to the eyes and *correctly* worn. If there is astigmatism and the glasses become mal-adjusted, reflex eye trouble again occurs; consequently the frames must be repeatedly readjusted to ensure that they properly correct the defect.

The Tongue.—This unruly member has a wonderful mechanism and is endowed with almost men-

tal attributes. Its mechanism is not only utilized in speech, but in preparing food for swallowing. It mechanically places the food between the upper and lower teeth for proper chewing, and, normally, rapidly takes itself away from the teeth so as not to be bitten. This wonderful mechanism is quickly realized when one has one or more teeth extracted and the chewing process is transferred from one side of the mouth to the other, a different mechanism prevailing than was operative before these extractions. Apparently, without thinking anything about it, certain types of food are referred to one side of the mouth for chewing and certain other types to the other side, provided all of the teeth are in place. This is automatic and occurs without any mental decision, and varies with the individual. When the mouth is disturbed by extraction, toothache, swellings, cankers, or other cause, the thoughtlessness of chewing becomes thoughtfulness, and the tongue often gets bitten, until it learns the new conditions.

Taste is one of the greatest of our protectors against poisoning, but the taste is not efficient unless the sense of smell is also normal. Between them food that is not proper to eat will generally be noted and refused.

Another delicate property of the tongue is its ability to pick out every little piece of bone or other objectionable matter and offer it for expulsion from the mouth, thus preventing its being swallowed.

Normally the tongue is pinkish in color and not coated. It becomes slightly coated with the least

indigestion and becomes dryish and coated if one breathes through his mouth at night. If the tongue is heavily coated, especially if this is persistent, the cause must be sought. It may be due to simple or to serious indigestion. It may be due to some mouth infection. The tongue almost invariably becomes coated in the beginning of any illness, and is generally coated in all feverish processes. If it is pale the patient is generally anemic. If it is large and flabby with indented edges it indicates poor circulation. If it is very dark in color, tending toward bluish, the circulation is in bad condition. If the tongue is very red, which sometimes occurs in certain serious conditions, consultation should be sought. If the tongue is coated only in patches, again the cause should be sought. In other words, the condition of the tongue is very indicative of the general health of the body, although some persons have a coated tongue throughout their lives without there being any serious excuse.

If a person's breath is bad, it may be due to some food, such as onions, garlic or radish, or it may be due to tobacco or alcohol. It may be due to indigestion, to an infected mouth or infected tonsils, or it may be due to a dry catarrh of the nose or throat. A disagreeable breath is very frequently due to an easily removable cause, that is, either to pyorrhea, trench mouth, decayed teeth, ill-fitting crowns, dirty bridges, infected tonsils, or to a nasal or throat catarrh that can be improved. The family should not tolerate a bad breath unless the cause can not be removed by medical or surgical treatment.

Constipation

This condition is very common, especially in the United States, where the majority of persons eat too rapidly, frequently eat too much, and often of indigestible or ill-chosen foods. Too concentrated nutriments and an insufficient amount of what is termed "roughage" (the indigestible parts of vegetables and fruits) are frequent causes of constipation. At the present time more fruit is eaten, which tends to cause normal bowel activity.

Another frequent cause of constipation is neglect of the desire for a bowel movement. This habit is especially formed in late childhood and youth. These young people, especially girls, are too busy to take notice of the calls of nature, and the habit of constipation is developed. It may be a symptom of some general disturbance, and especially of some disturbance of the stomach, intestines and liver.

At least one movement of the bowels a day seems to be essential, and two movements are normal. A few individuals may not have the bowels move more than once in two or even three days, without any adverse symptoms. Such a habit, however, is not normal. Some teachers of nutrition advise such laxative foods that a movement of the bowels occurs after each meal. This is a nuisance, and is unnecessary for health. The best time for the bowels to move is directly after breakfast, and one should attempt to have a stool at that time whether the desire is present or not, in order to form the proper habit.

The greater amount of physical exercise now taken

by the majority of people has lessened constipation, but some persons must take a laxative drug daily for years, in spite of exercise and eating a considerable amount of fruit and laxative foods. If the drug taken is a vegetable drug and is simple and non-irritant, it probably does no more harm than many foods and drinks. Coffee is more or less of a laxative. Tobacco smoking increases the action of the bowels.

Laxative salts frequently taken are generally inadvisable as they cause watery movements, lead to constipation afterwards, and tend to cause more or less weakness. Before resorting to drugs for constipation it is wise for the person to consult his physician. Many of the laxative pills and tablets on the market contain drugs that are not harmless when long taken.

Except occasionally, an enema (injection into the rectum) even of plain water is inadvisable, as the distention caused by an injection tends to dilate this part of the bowel and diminishes its normal contractility, and an enema habit is readily formed to the disadvantage of the individual. High enemas and so-called "colon washings" should never be used, except on the advice of a physician who is not a faddist.

Pain in any part of the bowels, high up or low down, is likely to cause constipation, and the cause of such pain should be ascertained. *Hemorrhoids* (so-called piles) are dilated veins at the lower part of the rectum and often occur, either internally or externally, or both. They are most frequently caused by constipation, hence constipation must not be

allowed to become a habit. When hemorrhoids have occurred medical or surgical treatment is often necessary.

"Bowel infection," "bowel putrefaction," "absorption of toxins from the bowels," autointoxication," and "intestinal intoxication" are all terms that have been over-used. There is no doubt that certain putrefactive conditions of the intestines will allow the absorption of toxins into the blood that are depressing and irritating to the nervous and circulatory systems, and may finally irritate the kidneys. Also, there is no doubt that constipation can disturb the liver function; may disturb the sleep by causing dreams; may cause eruptions on the skin and may otherwise interfere with the nutrition and health of the individual. On the other hand, too much stress has been laid on the condition of the intestinal digestion and excretion. It is a very bad habit for anyone to study, daily, his digestion and his bowel excretion, or to have his mind on what he eats and what it will do to him.

Sometimes constipation is caused by the falling (prolapse) of some of the organs of the abdomen when the person is too thin, or when he or she has lax abdominal walls. Physical exercises and muscle exercises aiming to strengthen the abdominal muscles are often of benefit. A normal amount of water should be taken, and especially does a glass of water on arising aid the bowel movements.

Most all fruits, fats and oils, and such vegetables as contain a large amount of cellulose or roughage, as corn, cabbage, cauliflower, squash, turnips and pump-

kin are laxative foods. Some of the syrups, especially maple syrup, are laxative. The breads that are laxatives are the whole wheat, rye and graham. It is a fad to-day to eat *bran* in some form. Twenty per cent. of bran is indigestible cellulose, and bran carries a slight irritant, which may harmlessly stimulate the bowels. However, in many individuals such an irritant is not harmless, especially if there is any tendency to diarrhea or an increased secretion of mucus from the intestinal walls. Ripe bananas are laxative. The banana retains water and therefore softens the stools. The most laxative fruits are oranges, melons, apples, prunes, figs, etc. Oranges eaten in the morning or eaten at night are of value. An apple or a pear eaten at bedtime will act satisfactorily with some people.

Agar is a seaweed that is very valuable as a laxative, and may be added to some cereal breakfast food or may be eaten with cream. The value of this seaweed is that it absorbs water and makes the stools softer.

Mineral oil is in very common use, and has been a fad for many years. It has many advantages, but it does not seem advisable to take this oil for any great length of time. It must of necessity coat the stomach and intestines and will somewhat slow digestion, although in the majority of cases it is perfectly harmless. Some persons can not well retain this oil in the intestines, and find it very disagreeable and a nuisance.

Yeast, another fad of the day, is somewhat laxative. It tends to change some of the intestinal

bacteria and is often of benefit, but it may cause an uncomfortable amount of gas to be produced. It will not prevent old age from developing and is not a rejuvenator, in spite of the advertisements to the contrary.

Various soured milks are many times of benefit and always carry a large amount of nutrition. *Acidophillus milk* is frequently beneficial. It must be remembered, however, that acidophillus milk, as well as ordinary milk, tends to cause the addition of weight. Sugar of milk (lactose) is also somewhat of a laxative.

When there is what is termed *gastric hyperacidity*, with heartburn, the eructation of acid liquid, the tendency of the indiviual is to take more or less bicarbonate of sodium or soda-mint tablets. Such treatment is harmless, but should not be persisted in without medical consultation. A cause may be present that needs treatment and too much soda in the stomach is not advisable

If it seems necessary for a *cathartic* to be taken, the choice may be castor oil, senna, cascara, some form of salts, or a mineral laxative water. The most used salt is the Epsom salt. A Seidlitz powder consists of two papers, the blue and the white, and the contents of each should be dissolved in 1/3 of a glass of water. They are then poured slowly together, and the whole drunk after effervescing is almost finished. If drunk too quickly the stomach may be dangerously dilated, and death has occurred from such rapid drinking of this effervescing mixture. Cathartics should not be taken frequently.

If a drug is needed for laxative action it should be something that is mild and that may be used for a time continuously until normal movements of the bowels are established.

At times it is wise to give an enema, that is, a rectal injection of some solution which may be medicated. The water should be at the temperature of the body and not given in too large amount. It is rarely advisable to add even soap to the water, as the bowels are easily irritated by it. Salt or bicarbonate of sodium may be added to the water. It is a mistake, unless ordered by a physician, to take enemas repeatedly, as the habit is not a good one.

It is to be regretted when drugs must be taken to cause movements of the bowels, but until a normal habit has been established it may be well to take some simple laxative.

The *laxative drugs* that are most used are cascara, aloes in some combination, rhubarb in some mixture, senna, and phenolphthalein. The most harmless is cascara, and it is best administered alone, either as a pill or tablet, or in solution. Generally it is best to take the laxative drug at bedtime, or sometimes directly after the evening meal, the dose depending on the results. Aloes is generally combined with some other drug and is given in pill or tablet form as is advised for cascara. Rhubarb is not now much used, although in combination it is a valuable laxative. It sometimes causes griping. Senna is one of the simplest of the laxative drugs and is perhaps the best laxative a child can have,

if it needs such a drug. Adults often chew the leaves, while the "syrup of senna" is a good preparation for a child. Phenolphthalein may be taken alone, or it is often combined with some other drug or preparation. It is best obtained in the form of a tablet. It is sweet and should be chewed; children do not object to taking it. Many of the "mineral oils" at the present time contain drugs and are not simply pure oils. Some contain agar and some contain phenolphthalein.

The main point to remember is that whatever artificial laxative is used the aim should be to omit it as soon as possible. Regular habits, exercise, laxative foods, fruits and plenty of water should soon prevent the need for laxative drugs. If a laxative must be taken, it is better to take something every night and gradually reduce the dose rather than to take a large dose every two or three days.

Chapter IV
Foods

Foods are divided into different types, namely, proteins, carbohydrates which include sugars, fats and minerals. Vitamins occur in many types of foods and are separately described.

Proteins.—A protein, also termed proteid, is a type of food that is necessary for the building of the structure of the body and for maintaining the health of this structure. A protein contains nitrogen, also carbon, hydrogen and oxygen. Roughly it contains about 16 per cent. nitrogen, about 50 per cent. of carbon, about 23 per cent. of oxygen, and a little sulphur. There are both animal and vegetable proteins, animal proteins of course being meats, fish, chicken and birds. Oysters and clams may not be considered meat. Eggs represent protein food; milk represents protein food. Wheat, rye and oats represent considerable protein, but they also, especially wheat, contain a large amount of starch (carbohydrate). The protein of peas, beans and gelatin are poor substitutes for meat. Some gland tissues, as kidneys and liver, are especially rich in proteins, but also contain a considerable amount of tissue that forms uric acid. Sweetbreads, which is pancreas or the thymus gland, and brain tissue contain considerable uric acid but are good proteins. The heart of an animal is an excellent protein. The nutritive part of proteins is represented by the amino-acids, which is the form that the protein is broken up into and which can be utilized by the body. There are

not far from twenty amino-acids, and each particular type is suited for some need of the body.

The consumption of meat varies in different countries. Only a few eat more meat than do the people of the United States, notably Argentina, Australia and New Zealand. Canada competes very closely with the United States in the amount of meat eaten. England comes next, then Germany, with the other European nations eating less than those named and Italy eating the least meat. It is rather notable that, though cold countries, Norway and Sweden do not consume half as much meat as does the United States; they doubtless eat more fish.

All of the meats are generally readily digested, perhaps remaining in the stomach not far from three hours. Pork in any form, whether roast, chops, ham or bacon, digests more slowly and remains longer in the stomach than other meats. Veal is slightly laxative to some persons as well as is pork, but both are excellent foods. Chicken, contrary to what is often thought, does not digest more readily than other forms of meat. Also, contrary to previous beliefs, fried meats may digest as readily as other forms of cooked meats.

To obtain the amount of nitrogen nutrition which is necessary for the growth and health of tissues, meat in some form is the most economical of foods. To obtain enough nitrogen from vegetable proteins one must eat too much in bulk, and indigestion is generally caused.

If individuals or peoples from childhood up are fed other proteins than animal food, their digestive

processes may become so arranged that they may have perfect nutrition, but such peoples generally live in warmer countries and are not subjected to the vicissitudes of cold and consequent hardship as are natives of other climates. They do not seem to have the withstand power against disease as do meat-eating peoples, although they may not have the same type of diseases as do meat eaters.

Undoubtedly Americans as a race eat too much meat. On the other hand, it has been lately shown that large amounts of meat, as personified by the Eskimo's food, are ordinarily harmless. The colder the region, the more meat and fat are required. The warmer the region the less animal food is required. Many persons incorrectly consider that a no-meat diet does not include going without fish and chicken. One can not survive without proteins, and if meat proteins are not taken, enough vegetable proteins must be ingested to supply the need of the body for nitrogen. Nitrogen is the base of the structural tissues of the body. A person deprived of all nitrogen in his food will soon waste away and die.

The unit of measure of the energy value of a food is termed a *calorie*. Proteins contain a certain amount of calories, but nowhere near the percentage that starchy foods contain or that fat contains. Therefore a diet consisting of meats only is disadvantageous, as it requires the individual to take more nitrogen than he needs in order to obtain the calories he needs for energy. An excess of nitrogenous foods requires the excretory organs to overwork.

The reverse is also true, namely, for human beings in the temperate climate to obtain enough nitrogen from vegetable proteins to supply the need of their muscles and tissues for growth and to prevent waste requires a large amount of vegetable proteins to be eaten. This gives an over-supply of calories, so that such food is disadvantageous and tends to cause an addition of weight and fat and a weakening of body strength.

Growing boys and girls require more food relative to their weight than do adults both as to nitrogenous foods and to energy-producing foods, the starches and fats. Children need the extra nitrogen for their rapid growth and extra calories for their excessive energy in order to properly grow and not lose weight. Young children require meat in the form of extracts or cooked broths soon after they are six months of age, and when they are about a year old they should have tender meat, well cooked and cut up fine, once a day. Meat once a day, a quart of milk and some bread and eggs will furnish all the protein that the growing child requires.

An active man requires *at least* 100 grams (about 3-1/2 ounces) of protein per day, and at least 2,500 calories (energy units) per day. The harder the work or the greater the amount of exercise, the more nitrogen (protein) and the more calories he requires, even up to 6,000 calories a day. Persons living in a cold, harsh climate require more food than those living in warm, mild climates. A large amount of meat and fat is required in the very

cold regions, while more starches and fruits are required in the warm regions.

It is estimated that an adult weighing about 150 pounds, working moderately about eight hours a day, requires as a minimum 100 grams of protein, 500 grams (about 18 ounces) of carbohydrate, 50 grams (about 1-3/4 ounces) of fat and 2 quarts of water; he also takes from 1/3 to 1/2 an ounce of salt (sodium chloride) a day. This is a minimum food requirement. It is much better for an individual to take more than a minimum, so that he will always have a reserve, as the body in health stores certain amounts of nutriment in forms that can be utilized when needed, and the healthy body rids itself without harm of surplus food products that are not needed.

A child should always have a reserve beyond his daily need. He requires from 1 to 1-1/2 grams (15 to 23 grains) of protein for each pound of his weight per day, unless he is obese. At five years of age a child needs about 1,500 calories each twenty-four hours for his energy health; at ten years about 2,200 calories and at twenty years 3,000 or more calories are needed. An adult with ordinary activity requires from 2,500 to 3,000, and with excessive activity many more calories.

Lists of the protein, starch and caloric values of foods may be readily obtained; therefore a complete list will not be given. It may be briefly stated that 1 gram (15 grains) of carbohydrate (starch) equals 4 calories; 1 gram (15 grains) of protein equals 4 calories; 1 gram (15 grains) of fat equals 9

calories. An adult at rest requires from 25 to 30 calories per kilogram (2-1/5 pounds) of body weight.

The vegetables and fruits vary greatly as to the amount of carbohydrate (starch) which they contain. The common vegetables that contain the least starch, 3 to 5 per cent., are asparagus, Brussels sprouts, cabbage, cauliflower, celery, lettuce, spinach, string beans and tomatoes. Those that contain, 10 per cent. of carbohydrate (starch) are beets, carrots, onions, pumpkin, squash, and such fruits as lemons, oranges, strawberries, blackberries, peaches, pineapple and watermelon. The vegetables that contain about 15 per cent. are peas, parsnips, lima beans, and such fruits as apples, pears, blueberries, cherries and raspberries. The vegetables that contain 20 per cent. or more are potatoes, shell beans, corn, rice, macaroni, spaghetti, and such fruits as plums and bananas.

The more fat or oil a meat or fish contains, the more calories it represents. The more oil a nut contains, the more calories it offers. Peanuts and chestnuts are the nuts that offer the most calories.

Anyone suffering from diabetes, besides seeking medical advice and following it, will do well to obtain Boyd and Stalsmith's "Manual for Diabetics," published by Funk & Wagnalls Company.

It may be well to here note that the foods that are acid-forming are meats, poultry, fish and the roe of fish; all such animal tissues as sweetbreads, liver and kidneys; all bread, cereal grains and breakfast foods; such vegetables as peas and beans; nuts; and all animal fats except cream and butter.

The foods that cause alkali to be formed in the body are most vegetables except peas and beans; milk and most fruits; especially are oranges, lemons and grapefruit alkali-producing.

It seems best that a child should receive about 50 per cent. of the calories that he needs in the form of carbohydrate foods. More than half of the other calories needed should come from fat, and the remainder of the calories from protein. Too much protein and fat tend to cause constipation, while too much carbohydrate is likely to cause looseness of the bowels. Children always require a certain amount of sugar.

As age advances and muscle activities and energy are diminished, the amount of food should be diminished, and especially should large amounts of meat and highly seasoned foods be avoided. Also, salt and sweets should be diminished; fruits should be increased; and there should be no excessive eating at any one meal.

The food taken in any one day, whatever the age of the individual, should be what is termed balanced. This means that the proper relationship of each type of food to the others (proteins, starches, fats, fruits and minerals) should be maintained. The human animal is omniverous and certainly seems to be, normally, carnivorous. In other words, he requires animal food. This is not to state that some peoples may not be strong and well without eating animal food of any kind, but they are, so to speak, "to the manner born." The large majority of mankind living in the temperate climate is much healthier

and stronger on a mixed diet of animal and vegetable foods.

It is a serious proposition to rapidly or abruptly change an adult's diet from a mixed one to all-animal or to all-vegetable foods. A change to an all-meat diet is of course rare, but the change to an all-vegetable diet is frequent, either by the actual orders of a physician or by a mistaken decision of a layman. A radical change of food is rarely advisable. The digestive system is trained by long habit to a metabolism of a mixed diet. To suddenly require that these chemical and physiologic processes should be changed to properly burn "soft coal" (vegetables) when they have been used to burning a certain amount of "hard coal" (meats) is a mistake. Indigestion, poor nutrition, and often poor health is the result. If certain diseased conditions require positive changes of the diet, such decisions can only be safely made by skilled physicians.

Meats contain more or less *purins*, which are substances that during digestion produce uric acid, and some individuals should not take large amounts of any substance that causes this acid to be produced, especially if they do not well excrete it in the urine. The glandular tissues are what cause the greatest production of uric acid, such as sweetbreads, liver, brain, kidneys, the roe of fish and the so-called "coral" of lobster. All fish as well as meat contains purin, with the exception of oysters and clams. Asparagus, beans and peas contain a small amount of purin; and one who is on a purin-free diet must

not take tea or coffee, unless the coffee has its caffeine largely removed.

There has long been a belief that there is a marked difference between red and white meat, and between meat, fish and chicken. Students of nutrition have not found this to be chemically, physiologically or nutritionally the fact. Therefore, those who have rheumatism, neuritis, gout, high blood pressure or kidney disease should reduce the amount of meat, in any form, that they eat, but they may eat either red or white meat, or fish or chicken. As above stated, a radical omission of all meat from the diet may be more harmful than beneficial, unless a physician has declared that there is serious kidney disease and that meat should not be eaten. The blood pressure is not raised by eating a small amount of meat, nor is it lowered by privation of meat. Many cold, flabby people should eat more meat. We have now learned that most neuritis and joint rheumatism is due to chronic infection, most frequently in the mouth, and is not due, as long believed, to uric acid from meat.

The appetite seems to occur with periodicity, depending upon the frequency with which meals are ordinarily taken. The smell of good food or the appearance of it, or even thinking of it will frequently start the appetite, probably by stimulating the salivary and gastric secretions. Food that appeals to the eyes as well as to the nostrils stimulates appetite, and good cheer is a stimulant to appetite and digestion. The reverse is true, namely, anything that depresses a person, as controversies, disagree-

able surroundings, bad odors, unpleasant looking food, and food that is not nicely served inhibit the appetite. Eating sweets or smoking before a meal interferes with appetite, and even drinking a glass of water just before a meal disturbs the acuteness of the appetite. Real hunger sensations seem to be caused by contractions of the stomach. Food that is disliked will stop appetite, while the reverse is true, namely, a food that is very acceptable to a person increases his appetite. Some persons have cravings for different articles of food, some for sweets, some for sours, and some for salty foods. It may show the need for such a type of food or it may show an abnormal craving, due to some disturbed condition of the body.

The frequency with which meals are taken is a habit. The majority of civilized people eat three times a day, some four times a day. The heaviest meal, theoretically, should be eaten as the evening meal, when one can rest after it. It is frequently better, however, for working people and always better for children to have the largest meal at noon. A late supper is rarely needed, although some simple food or fruit on going to bed may not be inadvisable, depending entirely upon the condition of the individual and his ability to sleep. Meat should rarely be eaten more than twice a day and in a large number of instances only once a day. As previously stated, the child requires plenty of protein food. Most people of the present era eat but a light breakfast, and perhaps the most frequent protein food taken is eggs in some form.

Eggs represent one of the best nutriments. An ordinary sized egg is equal to about 50 grams (not quite two ounces) of meat, and furnishes eighty calories. The greatest food-value is in the yolk. The white of egg, egg albumin, is of value when cooked, but is of no value when raw. Therefore, a raw egg represents much less nutriment than is supposed. Consequently, when a sick person is suffering from poor nutrition from any cause the raw white of egg is worthless and is a joke as far as food is concerned. Besides a large amount of protein the egg contains a little fat. In spite of the adverse belief, a hard boiled egg is not indigestible, and does not require a much longer time for digestion than does a soft boiled egg.

Milk.—One of the best protein foods is milk. It contains almost all of the elements for nutrition, especially for young children. Cows' milk, however, does not contain much iron. Milk alone is not a proper diet for an adult, and many adults should not drink milk at all, as frequently they do not well digest it. A quart of good milk is equal in food value to a little more than half a pound of lean beef. The United States consumes in one year an amount of milk that has a farm value of about $2,400,000,000.

For a young child, one quart of milk a day represents nearly sufficient nutriment. The vitamins and salts of cows' milk are not equal to those of human milk, therefore cows' milk is not as good for a young infant; also the infant who is nursing is less likely to have stomach or intestinal disturbances. A quart of cows' milk represents about 2 grams (1/15 of an

ounce) of calcium (lime), about the amount that is necessary for normal calcium metabolism in twenty-four hours. Good cows' milk is about 87 per cent. water, the other 13 per cent. consisting of about 4 per cent. fat, about 3 per cent. protein, about 5 per cent. carbohydrate, and a little less than 1 per cent. mineral matter. If milk is moderately heated, not boiled, the calcium and phosphates are not disturbed. If the temperature is raised much over 170°F, some of the calcium and phosphates are precipitated and lost. Top milk contains nearly twice as much fat as bottom milk, while skimmed milk contains only about one-third of the fat that bottom milk contains.

Artificially soured milk is very popular, and when it is treated with the acidophillus bacillus, called acidophillus milk, it offers germs that change the intestinal flora (bacteria) to the acid type and prevent putrefaction or combat it. This milk taken in quantities of at least a quart in twenty-four hours, with the addition of sugar of milk to the diet, and the omission of meat proteins for a few days, will generally entirely correct a putrefactive intestinal condition. How long it is wise to take acidophilus milk is a question that must be decided by the physician. Sometimes it causes indigestion as other forms of milk may do.

Some countries have various other forms of soured milk, all of which are more or less beneficial in certain conditions. It should be remembered, however, that acidophillus milk, Bulgarian bacilli milk, buttermilk, and yeast cakes are not "cure alls," and may not be advisable as foods in individual cases.

Pasteurization or mild sterilization (a heat of 140°F) of milk does not destroy many vitamins. More vitamins are destroyed by boiling. Uncertified milk may carry the bovine tubercle bacilli and infect children, unless it is sterilized, causing especially the bowel type of tuberculosis and glandular tuberculosis. *Certified milk* means that the cattle producing it have been tested for tuberculosis and found to be free from that disease. Properly prepared condensed milk is allowable in some cases, especially where cows' milk can not be well preserved. It may be obtained unsweetened for young children. Dried milks are often very satisfactory as extra food in sickness.

Milk sugar (lactose) is a good food. It tends to prevent fermentation in the intestines and is mildly laxative. It may be used to sweeten any food, or may be taken as a powder or dissolved in water. Dextrose and maltose are other useful sugars.

A valuable nutriment containing from twenty-five to thirty per cent. of protein is *cheese*. It largely consists of fat, and therefore furnishes many calories for energy. The amount of fat varies with the different forms of cheese, and most cheeses contain vitamins.

Nuts contain large amounts of protein, some carbohydrate and oil, the amount of oil depending upon the type of nut. Peanut butter is a rich food.

VITAMINS.—The vitamins are chemical hormones (active principles) which occur in foods and are absolutely necessary for nutrition, growth and health. If an animal or a human is deprived of any one of

these vitamins, serious symptoms occur. Their exact chemical composition has not been determined, but they occur in small amounts in certain kinds of food. The endocrine glands are essential in their chemical activities for the mental and physical health of each individual, and it is quite probable that the vitamins represent the substances that are necessary for these glands to produce their normal secretions. Children show a vitamin deficiency by loss of weight, fretfulness and paleness due to a diminished amount of hemoglobin. Such a condition is often due to privation of vitamin B. Yeast will cure these symptoms.[1]

At the present time five vitamins have been discovered. *Vitamin A* promotes growth, causes healthy tooth formation, and increases the resistance to certain infections. This vitamin is found in many foods, in the largest amounts in cod liver oil, butter and spinach.

Vitamin B increases the appetite and promotes growth. This vitamin is found in vegetables, fruits and especially in yeast. Oysters[2] are rich in vitamin B, and contain a small amount of vitamin A, and the antiscorbutic (against scurvy) vitamin. Clams, both hard and soft, contain vitamin A and B only in small amounts, but have considerable antirachitic (against rickets) potency.

Vitamin C also promotes growth, and in its absence scurvy occurs. This vitamin occurs in fresh vege-

[1] J.A.M.A., Aug. 4, 1928, p. 307.

[2] Editorial, J.A.M.A., July 28, 1928, p. 251.

tables and some fruits especially in oranges and lemons.

Vitamin D influences lime (calcium) metabolism, and in its absence rickets occurs, the teeth decay, and the bones do not properly grow and may become soft. This vitamin occurs in fish oils especially, and in large amounts in cod liver oil; it is also found in green vegetables.

Vitamin E seems to be essential for reproduction, and in its absence sterility occurs. It is found, however, in small amounts in so many kinds of foods that probably the human being is rarely deprived of this vitamin. While it occurs in small amounts in animal foods, it is found mostly in seeds, especially cereal seeds and in the leaves of green vegetables.

Carbohydrates and Vegetables.—Carbohydrates are foods that contain starch and sugar, and are composed of carbon, oxygen and hydrogen. These are energy-producing foods. The main carbohydrates are sugars, wheat and other cereals, corn, rice, potatoes, and many other vegetables. Bread is not the "staff of life;" one can not live on bread alone. Next to corn, potato is our greatest food plant, second only to wheat in the number of times a year it is eaten in America. In Europe it probably stands first. It contains a large amount of water, therefore, unless eaten in large amount can not furnish the food value that does bread. It is mostly starch, and contains a small amount of protein.[3]

The more refined the cereal, especially flour, the less vitamins it contains. A very valuable carbo-

[3] J.A.M.A., Aug. 4, 1928, p. 322.

hydrate is rice, but when refined by polishing it has lost some of its vitamins. Oats contain considerable starch and a large amount of protein. Rye and barley have considerable protein but not as much fat as oats contain. All foods made from wheat, as macaroni, spaghetti, etc., are carbohydrate foods.

Peas and beans, termed legumes, are perhaps the best vegetable protein foods, containing about 25 per cent. of protein. The soy bean also contains considerable protein. Ripe bananas contain a large amount of carbohydrate, which is readily converted into sugar. Many of the green vegetables contain but a small amount of starch. There are several varieties of beans, namely kidney beans, lima beans, soy beans, and string beans, all of which contain nitrogen. Peas are closely allied in food value to the beans.

Other important vegetables are asparagus, beet, Brussels sprouts, cabbage, carrot, cauliflower, egg-plant, onion, parsnip, pumpkin, squash, corn, sweet potato and turnip. The food grasses are represented by spinach, dandelion greens, beet greens, romaine, lettuce and endive. Other vegetables that are used more as stimulants to the appetite are cucumber, tomato and horse-radish. The various melons as muskmelon, cantaloupe and watermelon are used more as fruits. Tomato has been found to be a very valuable food, as it contains vitamins. There are many other less used and less known vegetables. The starch value and therefore the caloric value of these varies.

Sugar.—While sugar as such was for centuries

unknown, it has now become almost a necessity as a nutriment, as it is the greatest energy-producing carbohydrate. The increase in the consumption of sugar in civilized countries, and especially in the United States, is tremendous. In 1924, the consumption of refined sugar in the United States was stated to be 4,854,479 gross tons, an annual per capita consumption, at that time, of about 96 pounds for every man, woman and child in the United States. At the present date the per capita consumption of sugar in the United States is about 110 pounds.

The New York Times[4] stated that the candy sale in this country in 1926 was 1,083,399,754 pounds. This would represent about nine pounds for every man, woman and child, at a per capita cost of two dollars. This is candy alone, and does not include other uses of sugar. The consumption of candy has continued to enormously increase, so that in 1927 the number of pounds sold had increased to 1,300,000,000. More than a billion dollars is spent, annually, in this country for candy alone; at least one-third of a billion is spent for "soft drinks," which contain large amounts of sugar; about fifty million dollars for chewing gum, which means more sugar; a quarter of a billion dollars is paid for ice cream annually; and more than one-third of a billion for cakes. In other words, the consumption of sugar is enormous, perhaps one cause why the disease of diabetes is increasing.

Children require some sugar, and it may be given them in small amounts after a meal. It is harmful

[4] New York Times January 26, 1928.

for a child, or for anyone, to eat large amounts of candy, or to eat candy between meals, except occasionally. Sugar and candy are not healthful for the teeth, except in small amounts after a meal.

Sugar, or a large amount of starch which is converted into sugar in the body, is necessary for vigorous muscle activity. Athletes can do more strenuous work, running or other, when given sugar, especially if they are long deprived of food. Chocolate makes a splendid nutriment, containing both fat and sugar. Honey is a valuable nutriment.

When one should not for some reason or other partake of sugar, a substance termed saccharin, a coal-tar derivative, is often used as a sweetener. While small amounts are harmless, continuously taking this chemical drug is inadvisable and may do harm. It is much better for such individuals to learn to go without sweetening in their food, as soon they will not miss it.

Fats.—Fat is a normal part of the body structure and is necessary for the health of all the soft tissues of the body. On the other hand, when the amount of fat is excessive in any tissue that tissue is likely to become abnormal. When there are large deposits of fat, both internal and external, the individual is termed obese, and obesity is a handicap that should, when possible, be prevented.

Fats as food are necessary, as they furnish energy and promote the production of normal heat and temperature. Fats are digested in the intestines by the combined action of the pancreatic juice and the bile. An ordinary amount of fat for the adult to take

daily is about two ounces. We take this fat in the form of the fat of meats, the fat of oily fish, butter, cream, olive oil, and in small amounts in various cereals and nuts. Butter is about 90 per cent. fat, cream should be about 25 per cent., olive oil should be almost all fat. Most nuts are rich in fat; chocolate is almost half fat, and cocoa is about one-fourth fat. A very valuable fat food is cod liver oil. This oil also contains vitamins.

The adult ordinarily requires, unless he is overweight, from fifty to sixty grams (1-2/3 ounces) of fat a day. It is evident that those who are thin should eat more fat and those who are obese should eat less fat. However, the amount of fat that one should eat, even when thin, depends upon his ability to digest it. People in very cold regions, as the Eskimos, where vegetables are few and far between, obtain their energy from oils and fats, mostly fish or sea animal fats. In many disturbances of the digestive system fats are not well utilized, and it may be necessary to withhold them for a time from the diet. Any such condition, however, requires the advice of a physician.

MINERALS.—Sodium chloride, common table salt, is a necessity for health. It enters into all the tissues of the body except the enamel of the teeth, and is necessary for the production of hydrochloric acid, an important element of the digestive juice of the stomach.

The average adult takes not less than 10 grams (1/3 of an ounce) of salt per day. This is ordinarily more than he needs, and most of it is excreted

unutilized. Two grams (30 grains) per day will satisfy the needs of the body for sodium chloride. In other words, civilized man eats more salt than he needs; he seasons his food too highly. Salt does not occur in meats, except in sea foods; therefore one needs to add salt to his diet.

Many abnormal conditions of the body require that the salt taken with the food should be greatly reduced, sometimes almost eliminated from the diet. It is not well for anyone to over-salt his food. On the other hand, especially in acute fever and serious illness, it must not be forgotten that the patient requires some salt daily.

Phosphates.—Phosphates are salts that contain phosphorus, and phosphorus is necessary for the health of many of our tissues, especially the bones. Milk contains plenty of phosphorus, and many of our foods contain phosphorus, as cheese (which is made from milk), entire wheat, oatmeal, and some of the vegetables and nuts.

Calcium.—Calcium (lime) is a very important element, especially for the growth of the child, for the health of the bones, for the health of the teeth, and for the health of the nervous system. The enamel of the teeth consists almost entirely of lime salts and the saliva is generally rich in lime. The reaction of the saliva should be mildly alkaline. In calcium insufficiency the person becomes nervous, irritable, perhaps sleepless, and the bones, teeth, nails and hair are not healthy. When the diet is limited, it is very easy for it to be insufficient in lime, unless milk or cheese is freely taken. At the present time the

necessity of the growing child for lime is thoroughly understood; he requires more lime, proportionately, than the adult. Women require more calcium during pregnancy and lactation. Adults often select such food as is poor in calcium, consequently, they lose their teeth and have disturbances that are largely due to privation of this mineral.

If an adult does not care for, or is as well off without milk, it should be remembered that cheese contains plenty of calcium, as well as do some cereals, nuts, and fruit, especially almonds and oranges. As far as the child is concerned, one quart of milk furnishes more calcium than is needed per day, each quart containing about 1–1/2 grams (23 grains). About three ounces of cheese will offer the daily amount of calcium needed by adults.

Sometimes a child is given too much calcium, particularly when large amounts of cows' milk are taken, and indigestion may be caused. If too much calcium is taken it does not increase its absorption, but more is excreted. In diarrheas there is loss of calcium; consequently, a child subject to diarrhea requires more calcium. In rickets there is disturbance of the calcium absorption; cod liver oil increases calcium absorption and is a valuable aid in curing the condition. Calcium is now often given children in the form of carrots.

Iron.—Iron is an absolute necessity for normal red blood corpuscles. The amount required per day is very small, not more than half a grain. One grain of some form of iron is sufficient for the needs of the body for each day and allows a surplus for storage

or for waste, unless there is destruction of the red blood corpuscles by some disease or there is hemorrhage.

The new-born child has plenty of iron stored for his use for a time, but he must soon have this store of iron replenished. He obtains this from his mother's milk; but he can not obtain enough iron from cows' milk. Spinach and many other vegetables contain iron. Yolk of egg and all meats contain iron. Dried beans, peas, oatmeal and many fruits, especially prunes, contain iron.

In diarrhea and dysentery there is great loss of iron from the body, and extra iron must be supplied. However, in ordinary conditions the amount of iron required is very small and is easily supplied by the ordinary daily diet.

Iodine.—Iodine is always required for health, but in very small amounts. If iodine is absent, or an individual is deprived of iodine, goiter is likely to develop. Iodine is necessary for the normal activity of the thyroid gland, the goiter gland. Iodine is also necessary for normal mental and physical health, because thyroid activity is necessary for such health. Sea foods are all more or less rich in iodine. Sea air contains iodine. Mountain air does not contain it, and where people drink only mountain water they do not receive sufficient iodine. When iodine is insufficient only a very small amount of medication is required. However, one should not take iodine on his own initiative, any more than he should take thyroid gland extracts without medical advice, as harm may be done by such medication.

Iodized salt is advertised. When these salts were first prepared they contained too much iodine and were not safe. Though containing less iodine at the present time, they still should not be used. One person eats much more salt than another, hence he would get much more iodine than one who ate but little salt. In other words, the dose of iodine in iodized salt can not be regulated. Iodized salt and iodized water supplies are not safe, as they may cause serious trouble with the thyroid gland. The prevention of goiter should be individual, and should be directed by a physician. It is not safe to iodize people by the wholesale or by city water supplies.

Several other minerals and salts are taken into the body with food and drink and enter into some of the digestive and excretory processes.

Fruits.—Fruits represent a most necessary part of our diet. They are largely water, mostly containing 80 per cent. or more; they all contain some sugar, fruit acids, and some mineral salts. Most of these fruit acids do not act as acids when ingested, as they become alkalies during digestion and really increase the alkalinity of the fluids of the body. Such fruits are apples, pears, oranges, grapefruit, lemons, cantaloupe and watermelon. Prunes, plums and cranberries furnish an acid to the system. Pineapple juice contains an enzyme that may at times irritate the stomach. This enzyme is destroyed when the pineapple is heated or canned.[5] Cooked fruits are more easily digested than fresh fruits, and most fruits are laxative. Some few fruits cause consider-

[5] J.A.M.A., Aug. 4, 1928, p. 325.

able gas, and, therefore, in some persons indigestion. This is true of melons, peaches, cherries and some others. It should be noted that banana is not a fruit but is really a valuable starchy food.

The tartaric acid especially contained in black grapes does not become alkali in the body but acts as an acid. Some individuals are poisoned by strawberries, they causing hives or other symptoms of irritation. If anyone finds that a particular fruit always causes indigestion, he should avoid it.

Fruit that is eaten uncooked should be washed to remove all bacteria with which it may have become contaminated. Decayed and bruised spots on fruit should be removed before eating.

Fruit drinks of all kinds are very popular, but there is the disadvantage of thus consuming too much sugar. Lemonade makes one of the best drinks, especially for children; orangeade, if the child is younger, is a pleasant drink and requires less sugar than lemonade. Grape juice drinks are now very popular, but they may contain salts and acids, such as tartaric, that are not as healthful as the citrous drinks, that is, lemon, orange and grapefruit. Pineapple juice is very pleasant and carries some slight digestive properties.

In warm weather iced or cold food drinks are pleasant and nutritious, such as cold malted milk and thin oatmeal or barley water drinks.

The most valuable fruits for frequent use are apples, oranges, grapefruit, lemons, prunes, ripe peaches, ripe pears, and ripe pineapples. Most of of these fruits are slightly laxative. Canned ripe

peaches and pears make splendid desserts, when the fresh fruit is out of season. All of the small berries and cherries make a pleasant seasonable change of fruit. Most of them are mildly laxative, except blackberries which are slightly astringent. While grapes are a most valuable fruit, especially white grapes, black grapes often increase joint pains and bladder irritability in those who are subject to these symptoms. Watermelon is little more than water; it contains a small amount of sugar. The other melons (cantaloupes, etc.) are very nutritious and more or less laxative.

Coffee and Tea.— Professor Samuel C. Prescott, working at the Massachusetts Institute of Technology, received $40,000 from the Coffee Trade Publicity Committee for a research on coffee. The report of this research reached the public in 1926, and the part utilized by the coffee interests for advertising purposes stated that coffee was practically harmless. These advertisements tended to nullify all that had been said by medical men as to the harm that coffee could do some people, and consequently the sale of coffee increased.

During the last ten years the importation of coffee into the United States has greatly increased, and at the present time is probably more than 1,400,000,000 pounds. The United States Department of Agriculture[6] reports that nearly six and a half million pounds less tea were imported into the United States during the year ending June 30, 1928, than in the previous year, a decrease of 7 per cent. However,

[6] Hygeia, Oct. 1928, p. 580.

several million pounds of tea waste, tea siftings, and tea sweepings were imported under government regulations during last year. Practically all is converted into caffeine, and most of this caffeine is added to soda fountain drinks. Coca-Cola contains caffeine.

The increase in coffee drinking shows the greater desire of the people of the United States for stimulation. Afternoon tea has become a fad, as we ape England in this respect. This desire for coffee or tea, which give abnormal stimulation, is caused by habit, because it is the vogue and because people are mentally tired. Such over-stimulation can only increase nervous irritability. Probably 30,000,000 persons in the United States drink more coffee than is good for them.

The stimulating ingredient of coffee is *caffeine*, while the stimulating ingredient of tea is *theine*, which is practically the same as caffeine. A good cup of coffee contains about two grains of caffeine, and caffeine is a *drug* used in medicine. Therefore, a cup of coffee and a cup of tea are beverages that contain an active drug, which will cause more or less symptoms, depending upon the amount taken and one's idiosyncrasy to the action of caffeine. Approximately one pound of coffee will furnish thirty-five cups of the beverage.

One who is used to drinking coffee and tea becomes more or less immune to the action of caffeine, although any large amount of it will always cause symptoms. There are many persons who can not take even a small amount of caffeine, in any form, without having very unpleasant symptoms, notably,

palpitation of the heart and nervousness. If the caffeine is taken late in the day, sometimes even in the afternoon, these persons will have difficulty in sleeping that night. This caffeine idiosyncrasy is in evidence whether the caffeine is taken as a medicine, as tea or coffee, or is incorporated in a temperance drink.

Caffeine is always a nervous stimulant, and when there is nervous irritability it will increase it. It is also a cerebral stimulant, and when there is brain tire it will stimulate the brain to renewed activity. Therefore, when the brain is over-stimulated, overactive, and there is sleeplessness, caffeine is harmful. Excessive drinking of tea or coffee can not only cause increased cerebral stimulation, increased nerve irritability and palpitation, but may also cause muscle twitchings and tremblings, and not infrequently is a cause of indigestion. Tea and coffee are also stimulant to the kidneys and can increase their activity. Owing to the caffeine they contain, these beverages can more or less raise the blood pressure, and when there is high blood pressure they should be withdrawn from the diet.

While coffee and tea are splendid cerebral and muscle stimulants and, as beverages, do no harm in certain conditions, when not in excess, and do good in many cases where there is necessity for extra mental activity, nevertheless, it has been found that athletes are more proficient when they do not take coffee or tea or any other form of caffeine. When one is sluggish and sleepy and mentally tired coffee will temporarily improve his condition, but not as

much as an hour or two of sleep. Also, if this stimulation is frequently repeated, the good action becomes more or less temporary and the subsequent fatigue and nervous irritability increases.

Coffee contains an oil, caffeol, which is more or less of a stimulant to the digestion. It is this substance that gives the pleasant aroma to coffee. Tea contains tannic acid, and if it is steeped too long more of this acid is obtained from the tea leaves, and tannic acid impairs stomach digestion and is constipating.

It is frequently considered that cream in coffee interferes with digestion. This can no more interfere with digestion than any cream or milk taken immediately before or after a cup of coffee. If tea or coffee is made too sweet, the sugar may inhibit digestion as will any form of sugar in large amount taken with or after meals.

While coffee and tea can not exactly be called habit-producing beverages, there are coffee and tea habits, and the person who is used to this stimulation misses such stimulation when it is abolished. Also, as stated, excessive drinking of coffee or tea can cause the symptoms of over-irritability, sleeplessness, indigestion, irregular heart action, muscle twitching, increased blood pressure, and over-action of the kidneys, all of which conditions are improved and mostly abolished by stopping these beverages.

Coca-Cola has become, especially in some regions, a very popular beverage. It is stimulating because it has caffeine added to it, cola containing but little caffeine. Coca contains cocaine, which is removed

from it in this preparation. A Coca-Cola drink causes stimulation of the circulation and of the nervous system, as a glass of Coca-Cola may contain from 1 to 1–1/2 grains of caffeine. Beverages containing caffeine are not good for children.

It is an axiom that anyone who has kidney disease or heart disease, or has difficulty in sleeping should not take coffee or tea. After about forty years of age very many persons can not drink either one at the evening meal and then sleep well, although they can take them in the morning and sometimes at noon. Anyone whose heart becomes easily rapid should not take these stimulants.

It has been found that mother's milk, when coffee or tea is drunk, may contain caffeine, and when the nursing child is very irritable this may be the cause.[7]

It is self-evident that young children should not be given the stimulation of caffeine, either in the form of tea or coffee or in any other way. In spite of this general knowledge, it has been ascertained that very many children are given these beverages. In one investigation[8] of school children 57 per cent. were found to have coffee for breakfast. In a study of children of pre-school age it was found that over two-thirds had coffee regularly once a day, and about 40 per cent. had it more than once, while of the children of foreign-born parentage over 90 per cent. drank coffee. An investigation in eighty-six cities in the United States, where approximately 35,000 fifth grade school children, whose average age was

[7] Irvin, R. R.; Med. Jo. and Record, July 7, 1926, p. 37.

[8] Irvin, R. R.; Med. Jo and Record, Apr. 7, 1926, p. 434.

eleven years, were studied, showed that 39 per cent. of these children drank one or more cups of coffee a day, and in one city where 15,000 school children were studied, 56 per cent. drank coffee. It was also found that those who were stimulated by coffee did not do as good school work.

Young children of this age are generally nervous and excitable, and it is only in rare instances that coffee or tea could do them anything but harm. They have no proper rest periods. The days are long, especially with the daylight saving time, which is desired by certain people without regard to the wishes of mothers who have children and of farmers who oppose it. Also, many of these children have inherited neurotic tendencies from nervous mothers, who also have no rest periods, are over-stimulated, and may drink large quantities of tea or coffee. Children up to the age of puberty certainly should not be allowed these beverages, and after the age of puberty, if they are at all of a nervous type, they should not be given the drug caffeine in any form. If a boy or girl is taking part in athletics, his or her heart should not be made abnormally active by caffeine. These hearts have all they can do to sustain the excessive athletics of the age.

Nothing in the above is intended to prevent the normal adult from enjoying coffee or tea, if he has no idiosyncrasy against caffeine and if he has no disease that requires the avoidance of this drug. They make most pleasant beverages, and in ordinary amounts for the ordinary individual are harmless.

Lately, in the American anxiety for stunts, coffee

drinking marathons have developed, and recent press reports have described coffee drinking orgies as tests of prowess or for wagers. In these drinking bouts it has been reported that as much as one hundred cups of coffee were consumed during a short period of time. The participator in this type of marathon having survived, or at least not having been reported to have died, has caused laymen to believe that coffee is harmless. As a matter of fact, each cup of these one hundred cups of coffee did not contain the ordinary amount of caffeine, or the caffeine was not absorbed into the system, else poisoning would have occurred. The bulk of such an amount of liquid, namely, not far from four and a half gallons, taken rapidly into the stomach, which normally has a capacity of about one and a half quarts, shows the physical impossibility of the stomach to accept it, unless part of the liquid was regurgitated, or the valve that closes the opening between the stomach and the intestine was almost constantly open so that the liquid could rapidly pass on into the intestines. By no other method could catastrophy fail to occur, namely, terrible sagging and dilatation of the stomach or its rupture.

The ordinary medicinal dose of caffeine is two and a half grains, and each cup of good coffee should contain about two grains of caffeine. Therefore one hundred cups of coffee would contain two hundred grains of caffeine. It is obvious, therefore, that a person drinking one hundred cups of coffee would be severely poisoned, if even a small portion of the two hundred grains of caffeine were absorbed into the

blood. The coffee thus drunk obviously did not contain much caffeine, or the caffeine was not absorbed. Nature is a wonderful protector against man's foolishness, and, many times, the stomach especially and the intestines occasionally do not absorb harmful ingredients that may be taken into them.

Cereal coffees are made, which do not contain caffeine and furnish beverages that are substitutes for coffee. Coffee beans may also be obtained which have had the caffeine almost entirely removed, the caffeine being largely found in the shell of the bean. Coffee made from these treated coffee beans is, therefore, almost harmless as far as the action of caffeine is concerned, and is coffee "without its sting."

Cocoa which is used as a beverage has its fat removed and is very nutritious and easy of digestion. Chocolate preparations have the fat retained, and therefore are foods that offer a large amount of calories. Neither cocoa nor chocolate should be drunk by those who are overweight.

Chapter V

Diet

There have been, and are, many diet fads, the most common of which is the no-meat diet. In avoiding meat many do not realize that fish, chicken and birds are meat. Vegetarians are those who are supposed to eat nothing but vegetable proteins, starches, sugars and fruits. The majority of individuals in the temperate zones do not well thrive on such a diet. It is a mistake to believe that everyone who has high blood tension is benefited by not eating meat. It is almost invariably a mistake. Neither in reducing weight should a patient be placed entirely on a protein diet.

Going without breakfast is a fad, and going without luncheon is a fad. It may be all right in individual cases, but generally it is all wrong. These people frequently eat enough at dinner to last for twenty-four hours, which over-works their digestive systems and throws a sudden load on their organs of excretion. Common sense in eating, with a well balanced diet, and cutting out such foods as are not properly digested or excreted, and noting the general health of the individual is the only way to acquire the end desired by a change in diet.

Food should not be eaten too fast, and should not be taken too hot or too cold. All violent exercise after meals is inadvisable; neither is it advisable to lie down and sleep after a heavy meal, although there is no more harm, if one requires it, in taking some simple, easily digestible food at bedtime than there

is for a baby to be fed and put to bed. Puppies and kittens feed and go to sleep.

When one is very tired, he should not immediately eat, as digestion will be prevented. Most any nervous disturbance, and pain of any kind will interfere with digestion. This is typically true of the ordinary type of eyestrain headache when the digestion of a meal may be inhibited, and when nausea and vomiting occur the stomach may evacuate food taken many hours before.

On the other hand, it is wrong to withhold small amounts of easily digestible food because the patient has a fever. His nutrition must be kept up, if possible, throughout the fever process. This does not mean that during the first day or two of an acute disease one should not be almost on a starvation diet. Such management is frequently very beneficial, but if the illness is prolonged privation of food must not be continued more than two or three days at most. During this starvation period the patient should receive plenty of water and fruit juices.

With ordinary sensible, simple foods digestion should be almost without sensation. When there is an abnormal amount of stomach or intestinal gases, when there is pain, and when there is nausea or vomiting, the cause should be sought by a visit to the family physician. If the individual recognizes the cause, namely, that he is eating indigestible foods, too much spices, too much condiments, too much sugar, too much fats, too much fried foods, or too much soup; that he is eating too rapidly; that he is eating too many gas-producing vegetables; that he

is drinking too much ice water with his meals; that he is smoking too much; that he is eating too soon after laborious work; that he is working too soon after a heavy meal; or that he is too tired mentally or physically to eat; the indigestion can be corrected by himself. However, as soon as he does not recognize the cause of his indigestion, he should seek medical advice. Especially should he seek advice if he has any form of abdominal pain. Abdominal pain must not be neglected; it may have a simple cause or a serious cause.

Infant Feeding

Nothing in the following should be construed as suggesting that a mother decide for herself what food is best for her baby. That decision must be left to her physician. Every mother, however, should know some of the facts relative to the proper food for the normal nutrition of her child.

The best food for each infant is unquestionably the mother's milk or the milk of a wet nurse. Statistics show that fewer deaths of infants occur when they are breast-fed, and there is less illness in babies who are breast-fed. Mother's milk contains more hormones (active principles and vitamins) than artificial foods, and these hormones tend to provide for the needs of the child and also aid him in warding off infections. Mother's milk also contains more or less antitoxins against disease.

Good breast milk is mildly alkaline in reaction, should contain from 3 to 4 per cent. of fat, 6 to 7 per cent. of milk sugar, 1.5 to 2 per cent. of protein,

and is about 86 per cent. water. Each ounce should represent about 21 calories.[1]

The mother's food should not cause indigestion in the child, therefore she should eat nothing that causes her to have indigestion. She should have at least four meals a day; must have fresh air and sleep well. She should not be constipated. She must not be purged or have watery movements, but should have at least one movement a day. Bowel movements should be regulated by food, or something simple, as agar, or, if necessary, a mineral oil or an enema. Cascara may be well tolerated, but strong laxatives or cathartics should not be taken, as the milk becomes affected. All strong drugs and narcotics taken by the mother will affect the milk and cause symptoms in the child. If the child does not improve or gain weight, or seems hungry, or has much indigestion and is wakeful, the mother's milk should be examined to see if that is at fault.

Nursing hours should be regular, and if necessary the child should be wakened to be fed on time. The mother should alternate the breasts in nursing, and one breast should be emptied before the other is used. The feeding should be at three to four hour intervals, depending on the amount of milk in the breasts and the amount taken by the child. Fifteen to twenty minutes is long enough for a feeding. The child takes the most milk in the first five minutes. After the second month the baby should go from 10 P.M. to 6 A.M. without nursing, but should be given water. The young child, generally, needs more water than

[1] J.A.M.A., Jan. 13, 1923, p. 107.

he gets, and more than is contained in milk. At first water may be given by bottle. At the end of the third month one bottle feeding a day is generally needed, and the child should not be nursed after nine months.

For the first four or five days of its life the child loses some weight, from 8 to 10 per cent. of the first weight. A healthy child gains about four ounces a week. At six months, or before, he should have doubled his birth weight, and at the end of the year he should weigh about three times his weight at birth.

There should be two or three movements of the bowels daily. A slight greenish tinge of the movements does not call for a change in diet; small stools and much mucus show insufficient food. Crying after nursing often indicates poor milk. A tongue-tie may cause air to be sucked in with the nursing, which would cause indigestion and colic. Over-feeding is not common in breast-fed babies; it is denoted by regurgitation, and, if the over-feeding is continued, diarrhea will occur. The child's stomach should empty in about two hours, but in over-feeding the stomach may not empty in four hours, with more or less gas, distress, colic and vomiting. If there is much vomiting or watery stools, the child needs water, and will have fever if there is lack of it. Shortage of water is one of the most serious conditions in acute gastrointestinal disturbances.

If the stools are extra acid, redness and eruption occur on the child's buttocks, and over-feeding or wrong food may cause eczema. Intestinal indigestion

with either diarrhea or constipation may be a cause of pyelitis (pus in the lower part of a kidney), which is not infrequent in young children.

When a child cries it may not be from hunger; it may be from some other disturbance, which should be sought. Mother's milk may contain substances that cause the baby's blood to contain an irritant, which may cause various types of reaction, as eruptions, fever, or even asthma. A skin test by a physician may show the food to which an infant is susceptible.

Breast feeding should not be abruptly stopped, if possible. In changing to artificial food care should be taken that enough water is given. The best substitute for mother's milk is cows' or goats' milk. There is three times as much protein in cows' milk as in human milk, mostly as casein, and more than three times the amount of inorganic salts as in human milk.[2] The fat varies in amount, but is not dissimilar to that in human milk. There is less iron in cows' milk than in mother's milk, although even mother's milk has not sufficient iron to satisfy the needs of the child. The child, however, has stored iron before its birth, and, consequently, may not need extra iron during the first months of its life. Later, the child should be given meat and vegetable broths, and it will thus obtain iron. Cows' milk contains vitamin A and a small amount of vitamins B and C.

Goats' milk[3] contains more protein and less sugar

[2] J.A.M.A., Feb. 17, 1923, p. 474.

[3] J.A.M.A., Feb. 17, 1923, p. 551.

than human milk, and generally more fat than cows' milk. Goats' milk and cows' milk contain more phosphorus than human milk. Goats do not have tuberculosis.

A mother who has tuberculosis, serious heart disease, any serious chronic infection, diseased kidneys or liver, or asthma should not nurse her child. If she acquires any acute infection that causes much temperature, or that would be dangerous to the child, nursing must be stopped immediately. Nursing should be stopped if the mother becomes pregnant.

Pasteurizing milk decreases some of the vitamins, and boiling destroys some of them. If such milk must be the food, cod liver oil and orange juice should be given. It is well to give most infants cod liver oil at three months of age, beginning with five drops, daily, and increasing to a teaspoonful twice a day by the end of the sixth month. It has been found that most children easily have mild forms of rickets, and cod liver oil will prevent this condition. Orange juice seems to be necessary on account of its vitamins, and should be given during the second month, twice daily, in doses of one-quarter of a teaspoonful, diluted. This amount should be gradually increased to an ounce by the end of six months.

Infants differ in their tolerance of fats, and in many it is necessary for the physician to study the stools to determine the amount of fat that the child's food should contain. Cane sugar as well as milk sugar may be needed by an infant. Milk sugar is more or less laxative. Lime water (about one teaspoonful to 3-1/2 ounces) added to the milk of arti-

ficial feedings prevents the formation of large curds.

In preparing food mixtures the exact amount of each ingredient must fit the individual child; hence the child should be studied by a physician that the proper food formula may be outlined for the mother or nurse. This formula, of course, must be modified from time to time.

Obesity

Insurance companies will generally accept an individual who is twenty-five pounds over the standard weight, provided he is otherwise healthy, and that the weight has not rapidly developed. Especially is overweight allowed when the family history shows a tendency to overweight. In other words, family traits are hereditary. An obese child or youth is abnormal. In such cases there are disturbances of the endocrine glands, and a careful study should be made of each over-fat child by a physician who is skilled in the treatment of diseases of these glands.

There is a normal tendency to add weight after forty years of age, both in men and in women; more women after forty-five are overweight than men after that age, as they normally add weight after the menopause. Anyone who is overweight should be carefully studied as to where these deposits of fat occur, as various types of obesity are produced by different causes. At any age the endocrine glands may be at fault, more especially the thyroid may not be secreting sufficiently. Also, frequently, the pituitary gland (located in the lower part of the brain) may be abnormal in its secretions and be the cause of characteristic deposits of fat.

Overweight interferes with physical activity, and from this cause alone the individual becomes more sedentary and tends to add still more weight. In many instances the cause of overweight is over-eating. On the other hand, when there is disease of the endocrine glands the amount of food taken and the character of it may not be the cause of the obesity; however, the diet is always a primary consideration.

Overweight is a serious condition because it requires so much more physical energy to carry the individual about, to climb stairs, and to do ordinary labor. The heart is the organ of the body that suffers most in the abnormally heavy person. If the obese person continues to be active without shortness of breath and without heart distress, his heart must hypertrophy, that is, increase its muscular power to cause this efficiency. Frequently, added to this increased heart power is an increase in blood pressure, and with these two conditions the fat person may be very efficient, but after years of such efficiency the heart becomes tired and more or less disability occurs. Consequently, these persons are not as long lived or as long active as the majority of those who are of normal weight.

It is a mistake for the obese person to attempt to reduce his weight without medical advice, except by the common sense of taking more normal physical exercise, best by walking, and by avoiding foods that he well knows add to his weight. However, any excessive exercise or any radical changes in diet should not be instituted unless he has sought medical advice, as serious injury may be done.

Various sweating measures are sought by these patients, often without a physical examination, such as sweating baths, cabinet treatments, etc. They frequently do harm.

It is exceedingly dangerous for anyone to take one of the patent medicine treatments for obesity, as most of them contain thyroid gland extracts, and thyroid treatment should never be undertaken without medical advice and medical watching of the results of such treatment. In fact, thyroid extract should be listed with the narcotic drugs that can not be obtained without a prescription.

The foods that obviously should be taken from the diet in obesity are the fats, oils and sugars, and such vegetables as contain a large amount of starch, typically corn, potatoes and beets. The amount of bread taken should be reduced, and most of the cereals should be avoided, especially rice. Milk and cream and the oily nuts should be avoided. One should learn to eat food and take drinks, if coffee and tea are allowed, without sugar, or at least with a minimum amount of sugar. The various temperance drinks that are so much in vogue should not be taken as they are loaded with sugar. Ice cream should be reduced in amount.

The object of the diet should be that there must be no privation of the different elements that are necessary for health, but the amounts of all should be greatly reduced. There should not be over-eating of proteins, that is, meats, but sufficient should be taken. The starches taken at each meal should be reduced in amount. If a certain amount of bread is

desired, potato, rice and corn should not be eaten at that meal. If a potato is desired, there should be no bread eaten at that meal; if rice is eaten there should be no other starches taken at that meal. If ice cream is desired, the starches at that meal should be reduced.

All of the green vegetables and most fruits are suitable foods for the obese. Between-meal eating should be avoided. Saccharin, a chemical drug, may be added in small amount as a sweetener of food and drink, but if long taken it is not healthful. Anyone can soon learn not to dislike his drink without sugar, and a small amount of sugar may be used for the seasoning of some foods. Every overweight person should learn to leave the table rather hungry; he must not eat to satiety. Many people eat with their eyes, and keep eating because the food looks appetizing. Eating of large amounts is also a habit; one soon becomes satisfied with much less in amount.

To repeat, obese children and youth are abnormal, and their condition should be studied medically. Certain types of obesity in the adult are abnormal, and these persons should have medical advice. All types of obesity are not safely managed by the individual without having a good physical examination and obtaining a diet that is correct for him. During the reduction of weight more or less frequent examinations should be made to note that injury is not being caused. Rapid reduction of weight is never advisable. A loss of two pounds a week should rarely be exceeded, and the loss should cease as soon as the individual reaches a weight that is deemed

normal for him, and each person should be individualized. A normal weight for one person at a certain height and age may not be the normal weight for another person of the same height and age.

The diet restrictions in obese children and youth should be very carefully supervised, and should never be severe or rigid. Also, after fifty-five years of age the diet restrictions should not be severe, and in adults after a loss of about twenty-five pounds the reduction should, temporarily, cease, but there must be no regaining of weight. If advisable, after a month or two, more loss of weight may be attempted. The time to prevent obesity in the adult is when the increase in weight begins.

To repeat, the layman must be cautioned that a rigid diet should not be undertaken by him without medical supervision. He may too rigidly deprive himself of sugar and starches, or he may deprive himself of necessary vitamins.

Food Poisoning

Food infections are quite common, especially in children. The term "ptomaine poisoning," signifying poisoning from degenerated food, is a name that should be abolished. While toxins may occur in food that would cause pain, diarrhea and vomiting and perhaps more serious symptoms, almost invariably the cause is due to some form of bacteria. In other words, the food is infected.

The symptoms of food poisoning are well understood by everyone: bowel pains, often slight fever, thirst, frequently vomiting, and almost always

more or less diarrhea. The temperature may rise quite high, or there may be prostration and subnormal temperature. The greater the amount of diarrhea and pain, the more likely is there to be faintness and collapse.

The length of time before the symptoms occur after the infected food has been eaten varies from a few to ten or twelve hours. Consequently, the food vomited may not represent the food that caused the trouble. In other words, the guilty food may have been eaten many hours before. That these bowel upsets occur more frequently in warm than in cold weather is due to two facts: (1) food deteriorates more rapidly in warm weather, and (2) rapid changes in temperature may have subjected the individual to chilling, which predisposes to bowel upsets and to mal digestion of even good food.

Unless a damaged food is camouflaged by strong condiments or sauces, the smell and taste will generally quickly detect a food that is not good. Of course a young child does not know or interpret the proper taste of a given food, but the adult should refuse to eat any food that tastes or smells abnormal.

The most dangerous germ occurring in food that has not been properly preserved is the *botulinus*, which has been in later years frequently found in imperfectly canned vegetables and even in canned meats. Especially is this germ found in home-canned foods. It is excessively dangerous and may quickly cause death. Whoever opens a can of food of any kind should note the appearance of its contents and the odor, and, if it looks or smells abnormal, should

refuse to eat it or offer it to others. Boiling a food infected with the botulinus for half an hour will kill this germ, but such treatment will also ruin most preserved foods.

The immediate treatment for any acute stomach or intestinal upset is an emetic, as mustard in water, if the food is supposed to be in the stomach and vomiting has not occurred; then some quickly acting cathartic should be administered, as Epsom salts or some other saline cathartic. A physician should be immediately summoned and a portion of the food that is thought to be guilty should be saved for analysis and laboratory study. The patient should be given large amounts of hot or warm water to drink, even if it is vomited, and he must be kept warm, if he is cold.

Meat and some forms of fish imperfectly cooked and some vegetables and fruits may contain different types of worms or their eggs, which may grow in the body and cause serious infection. Tapeworms come from infected beef, pork and fish. Roundworms, pinworms and some rarer forms of worms may enter the body with uncooked vegetables and fruits. Hookworms enter the body through open sores or cuts in the skin.

When these infections are suspected or there is evidence found in the stools, and when abdominal symptoms occur with lack of strength and loss of weight, a physician should be consulted for diagnosis and treatment.

Chapter VI

Health Axioms

1. If possible, a mother should nurse her child at least three months, and better six months.

2. If a child can not have its mother's milk a formula for feeding should be obtained from a competent physician. The food must be well balanced so as to contain all of the elements for nutrition, including vitamins, necessary salts and minerals.

3. If a child does not thrive on either his mother's milk or prepared foods, something is wrong which must be corrected.

4. Orange juice, vegetable broths and small amounts of cod liver oil are essential for the health and growth of infants after weaning.

5. The child requires more water than it often receives. Fever may be caused by privation of water.

6. Cows' milk does not contain enough iron for nutrition, and cows' milk, in winter, is short on vitamins.

7. Coffee and tea are veritable poisons to young children, and, if much of either or both is taken by the mother, her milk may contain enough caffeine to excite the nursing child and make him restless.

8. Children must have rest periods.

9. Each child should have periods of being alone and amusing himself. Too much is done for children; their brains are not allowed to develop self-reliance. Young children should not be taken to the "movies."

10. If a child has brain-storms, or vomiting turns, or does not progress in school, or has frequent colds,

careful investigation should be made of his eyes, ears, nose, mouth and throat.

11. Any drug habit, any diseased condition, any privation of food, and any focal infection (mostly in the mouth) that interferes with the mother's endocrine glands (glands of internal secretion, thyroid and other) causes her child to be born handicapped as to health and normality, mentally and physically.

12. These deficiencies in the child, if looked for and determined soon after birth, may be corrected by proper medication and proper food.

13. The eruption of the teeth and the date of walking and talking distinctly show the presence or absence of endocrine gland and nutritional disturbances.

14. While milk alone is the best known food, it is not always sufficient.

15. Bread alone is not a sufficient food for anyone.

16. Eggs are an excellent food, but *raw* white of egg is not a food and as such is valueless.

17. Sugar is a stimulant and a valuable fuel when not misused.

18. Meat (and chicken and fish are meat) does no harm in high blood pressure unless the kidneys are in a condition of acute inflammation or congestion.

19. Fruits tend to lower blood pressure and render the bowels active.

20. Watch the teeth at all ages. Seek dental advice concerning their health and normality.

21. Devitalized (dead) teeth, imperfect crowns, ill-fitting bridges, and pyorrhea are a menace to health. They may cause various serious diseases, from

rheumatism to anemia and heart disease, to say nothing of being a frequent cause of simple disturbances such as boils and skin eruptions.

22. It should be recognized by all that it is absurd to have a so-called "prophylactic treatment" for pyorrhea of the mouth and then to again use the same infected toothbrush. Also a bristle toothbrush must become infected in all types of sore throat and from a suppurating tooth socket after a diseased tooth has been extracted. Hence a bristle toothbrush should not be used in these conditions, unless it is sterilized after each use.

23. An infected tooth is a menace, and every dead tooth sooner or later is a menace; all pyorrhea and infected tonsils are menaces.

24. If a child develops a contagious disease or a sore throat his toothbrush should be destroyed, and during the illness his teeth should be cleaned with gauze or pledgets of cotton moistened with milk of magnesia or boric acid solution. After he recovers from his illness he should have a new toothbrush or a subsitute for a toothbrush. His infected toothbrush must not come in contact with the brushes of other children.

25. The bristle brush as used and cared for is a veritable laboratory of bacteria, both harmless and harmful, hence it should be abolished. Is it appealing for a toothbrush to repose in the atmosphere of a bathroom or at a washbowl, where it is subject to fumes, dust, and perhaps flies? Sanitary substitutes for the toothbrush may be obtained.

26. The use of tobacco by the mother during preg-

nancy and lactation is harmful to the child. The physician is cautious in administering any strong drug to a pregnant or lactating woman; why should nicotine be thought harmless?

27. Tobacco is distinctly harmful to girls, interferes with the growth, mental and muscular, of boys, and especially handicaps the heart in its normal development. All trainers of athletes, who are to compete by physical strenuosity, prohibit the use of tobacco.

28. At any age the use of tobacco, coffee and tea should be moderate. One or all may need to be prohibited, according to the effect on the person.

29. One should not be too much disturbed because a child is underweight, if he is properly nourished and is well. Much overweight requires attention, especially in children; it is abnormal.

30. Adults should not over-eat. On the other hand, under-eating in this life of restlessness and strenuosity is a menace. We must have sufficient fuel to prevent waste and loss of vitality and to satisfy all the chemical requirements of our wonderful machinery.

31. We must demand pure foods and liquids. We should personally and collectively and by legislation demand that food and drink *be not rendered harmless and kept harmless by antiseptics*. Good pure food and good pure milk and water do not need chemicals to preserve them. Foods containing boric acid, sodium borate, sodium benzoate or sulphur dioxide are detrimental, and such preservatives are not needed, if the food is pure. Saccharin should not be used as a sweetener of foods and liquids unless it is so stated

on the container, and the public should know that saccharin is not healthful.

32. Everyone should know that diabetes is on the increase and that the consumption of sugar, which has enormously increased, is a cause.

33. Everyone should know that heart disease is on the increase and that neglected infection in the mouth is a frequent cause of this serious condition.

34. Before taking a so-called "nostrum" medicine let the person ascertain, from some authority, what the preparation contains. It may be harmful or useless, or it may contain some simple active ingredient that can be bought for a few cents.

35. One should never drink out of any public or community drinking cup or use a public towel. One should never use a public telephone without first placing a clean handkerchief over it. Home and public telephones should be frequently cleaned with alcohol or peroxide of hydrogen solution, and a dental napkin or clean handkerchief placed over them, if anyone in the home or office has a cold and uses the telephone. The telephone is a frequent means of causing colds and grip to attack a whole household or an entire office staff. One should always cover the mouth with a handkerchief (not the bare hand) when sneezing or coughing.

36. Let each individual see his physician once in six months, or always once in twelve months, for a general investigation as to his health. No matter how well he feels, some insidious defect may be developing, and to prevent sickness is cheaper than to be sick. It would seem that the human being is

worth more than an automobile, and an automobile is looked over regularly and every time there is a "skip" of any kind.

Choosing a Physician

Our laws are so lax that almost anyone, by shorter or longer study, some only by correspondence courses, may receive a certificate giving him a "degree" which allows him to advertise as a "doctor." The layman does not recognize the difference in the value or meaning of these degrees and frequently thinks that everyone having this title on his sign or cards understands the human body and can treat it. Most states require a license for anyone to practice any branch or form of medicine, but the requirements for licenses to practice different types of medical treatment widely vary. The so-called *regular* physician, often termed an allopath (which was the name applied to regular physicians by the homeopaths to distinguish them from that branch of medical practitioners) must spend at least seven years in medical studies before he receives the degree of M.D., and must then pass a strict State examination before he is licensed to practice medicine. The *homeopathic* physician was so called because for very many years he believed in the principle that like cures like, meaning that drugs that would cause symptoms of the disease the patient had were curative to that disease. In the present era the name is a misnomer, because these physicians study the same number of years as the "regular" physician and no longer believe in the old homeopathy. These two branches of

practitioners belong to the same medical associations, and are agreed on the interpretation of the scientific investigations of all branches of medicine.

Besides these highly educated scientific practitioners who are allowed to treat the ills of human beings only after long years of study, there are a number of other types of practitioners who are allowed to care for human ills and human life with a more or less limited amount of medical study and preparation. These types of practitioners must also pass State examinations for a license to practice their particular methods of treatment. Their licenses do not allow them to administer drugs, nor allow them to sign death certificates. In other words, they are not considered by the State to be full practitioners of medicine; their work is limited.

A State Legislature has recently passed an amendment to an act licensing the Chiropractor to treat human ills by his methods. In part this amendment reads as follows: After passing the prescribed examination the Chiropractor is licensed to "adjust by hand any articulations of the spinal column, but shall not prescribe for or administer to any person any medicine or drug included in materia medica or perform any surgery or practice obstetrics or osteopathy."

If one has a sense of humor (apparently the legislators who passed this act did not have such an asset) he must hughly enjoy the restrictions that a Chiropractor must not use any osteopathic "adjustments" in his manipulations or replacements of "dislocations" or "impingements" on the penalty,

if convicted, of losing his license. A patient's testimony would be interesting on just when in the "treatment" the operator changed from the chiropractic act to the osteopathic adjustment. The reverse must be true, namely, the Osteopath must not use chiropractic thrusts or manipulations.

Another recent State enactment is an amendment to the act licensing the Natureopaths of which the following is a part: If the Natureopath passes the examination he is licensed to treat humans by "psychological sciences, such as psychotherapy; the mechanical sciences, such as mechano-therapy, articular manipulation, corrective and orthopedic gymnastics, neuro-therapy, physio-therapy, hydro-therapy, electro-therapy, thermo-therapy, photo-therapy, chromo-therapy, vibro-therapy, concussion and pneumato-therapy and the material sciences, such as dietetics, and external applications; but shall not mean internal medication or the administering of any substance simulating medicine or the form of medicine."

A few methods of treatment the Natureopath is not licensed to use, namely, the atmospheric pressure treatments by an airplane ride or by descent into mines. He should not have been so limited!

These practitioners licensed to treat human ills by "drugless" methods must not write prescriptions, but they can not be prevented from verbally instructing a patient to buy a drug or drugs and take it or them in a suggested dose and in a suggested frequency. They thus treat human ailments without the six or seven years of study required of the regular physician before he can practice medicine. Also no

one of these operators who is outside of the regular licensed practitioners of medicine is, as yet, allowed to write a death certificate. Hence he must be very careful to discharge a failing patient into the hands of a regular physician before the finale of all mankind takes place. His license helps him to do this contemptible trick. In other words, these practitioners profit by half sick patients and do not bear the responsibility of death, a sort of "heads I win, tails you lose."

The Christian Scientist does not need a license to practice the healing art. As he does not believe in death he naturally does not treat disease, therefore licensing laws for the treatment of disease can not apply to him. It is interesting to note that the Christian Science "healer" charges for the treatment of a disease which in his opinion does not exist. He says he treats the mind that is mistaken in thinking that the body is sick. These mind healers derive good incomes from the treatment of "non-existent disease." They also give absent treatments.

By law the Christian Scientist must not treat a contagious disease. Therefore these healers, without any kind whatsoever of medical education, must decide that a patient coming for mental treatment does not have a contagious disease. Quite a miraculous accomplishment!

If by mistake in judgement a patient undergoing a Christian Science healing treatment should die before he is referred to a regular physician, the medical examiner of the city or town must by

autopsy decide what mistake the person made by dying of what he did not have.

The layman often selects one of these more or less incompletely medically educated practitioners to diagnose and treat his ailment, while it is exceedingly rare for a layman to select a veterinary surgeon for a horse, cow, dog or pig, who is not a thoroughly trained expert. Inquiry of the City or State Board of Health will inform him the length of time each type of medical practitioner must study before he receives his license.

If he moves to another town or city and has therefore lost the opportunity of employing his regular family physician, he should select his new physician after ascertaining who are the attending physicians of the nearest large city hospital, and which physicians are members of the City or County Medical Societies. He thus has a wide choice, which may be narrowed down, by later inquiry or investigation, to the type of physician or surgeon or specialist that he requires. The layman should know that the skilled physician treats the *patient*, who has the disease, and not the disease. There are antitoxins and specific treatments for some few diseases, but even in these diseases no two people can be treated alike successfully. Each patient is an individual and, consequently, must be individualized in the medical management of his illness. Each one has his peculiarities, his tendencies, his heritage, his susceptibilities, his immunities and his idiosyncrasies to drugs and doses of drugs.

Clothing

In this age it is difficult to state just what the proper clothing should be. Fortunately, the over-clothing of young children has now been mostly abolished. The poor infant could not kick, could not expand his lungs, or do much of anything that he should be able to do. The young child is, lately, sometimes under-clothed, sometimes over-clothed. The female child of three to ten or more years of age goes out, even in winter, with bare knees and bare legs, while the male child of two, three or four years of age is often seen in winter in the "Eskimo" or "brownie" costume in which he probably is hardly able to breathe and the perspiration must remain on his skin. There certainly is a happy medium between these two clothing habits. The young girl is unquestionably, in this age, under-clothed except for the very hottest of weather. During most of the fall and winter she is cold. She denies this, but it is true.

It is often the boast of a man or woman, especially the man, that he wears the same underclothing the year around in the changeable temperate climates. This would seem hardly sensible. To be sure, our houses are warm, generally too warm in winter, but a heavy overcoat when going out in the severe cold is not sufficient, except with exercise, to keep the skin normally warm with the thinnest kind of cotton fabric; in other words, the summer "BVDs." Normal health requires that the body proper shall be warm, not hot, in winter; and not cold, but comfortably cool in summer.

There are various types of underclothing, as cotton, linen, silk, nainsook, rayon and wool. Therefore, the choice for each individual for each season of the year is sufficient for comfort, both to be cool in warm weather and to be warm in cold weather. There is no reason why the underclothing should not be changed with the weather. The warmer underclothing put on during a cold week in the fall may be changed to thinner underclothing when a period of warm weather succeeds. Linen mesh is a fine type of underclothing, as it is both warm and cool, and allows ready evaporation of heat and perspiration, and yet when the individual does not perspire, it keeps the cool air away from the body.

It has been found that the thinner cotton underclothing may be sufficiently warm, and perhaps very healthful. Woolen underwear may not be needed except when the individual is to be exposed to severe cold, however, nothing keeps one warmer in very cold weather than thin woolen shirt and drawers. If a workman must be exposed to the severe vicissitudes of weather, he should have thick woolen underwear.

It is not recognized that all underclothing becomes impregnated with all kinds of germs, most of which are innocent, but some are disease germs. Nothing but boiling will absolutely kill these germs. Cotton underclothing can be boiled without damage; woolen can not be boiled; and it is not very good for silk to be boiled.

An adult may produce in summer about half a gallon of perspiration a day, and is said to give off

enough heat every hour to bring a quart of water to the boiling point. For one to be comfortable in hot weather all this heat and moisture must readily pass through his underwear. Over-heating of the body causes harm.[1]

As is recognized by all, with the same thermometer reading, a dry, breezy day feels cooler than when the air is full of moisture, which is termed humidity. The higher the humidity, the more uncomfortable the warm atmosphere.

Shoes

In general, the shoes of to-day are an improvement on the shoes of yesterday. But the dictation of what the style of shoe shall be by the shoe makers and the czars that decide what a woman shall wear on all parts of her body is little less than coercion and partakes of monarch and serfdom. The low shoes now in vogue for women tend to strengthen the ankles, and are cool and in many ways are of advantage. On the other hand, during the winter months, to tell an older woman that she can not obtain a high shoe without having it especially made for her, at a price of twenty dollars or over, is a cruel hardship. Having for long years used high shoes, she feels the necessity of the support and also for the ankle warmth thus furnished.

At the present time the excessively high heels are not much in vogue for walking, except by a few foolish girls and women. The lower, broader heel is the type that should be obtained for walking and

[1] Hygeia, July 1928, p. 736.

for all ordinary work; house, office, store or factory. The heel ordinarily should not be too low, as too low heels tend to cause weakening of the arch. The greatest crime of the present mode for shoes is the tightness of the shoe over the top of the foot and of the straps over the instep. The majority of women and girls wearing these shoes, after a few hours and almost invariably after half a day, show distinct puffing of the flesh on the parts above the restrictions. By all physiologic and anatomic reasoning such a treatment of the feet can not be sensible, and must sooner or later do harm, and does do harm. This impeding of the circulation is senseless, and the irritation and sometimes pain caused in the bony parts of the instep and top of the foot are very much in evidence.

While we are on the subject of straps over women's feet, it may be well to note the age of constriction of the legs and thighs. Elastic garters are frequently worn about the knees, sometimes so tight as to make indentations and red bands. There may be elastic bands over the lower part of the thigh, above the knee, sustaining the stockings, if a corset is not worn and side garters are not used. Band three on the lower part of the thigh may be due to elastics on bloomers. This, with bands two or three over the tops of the feet makes from five to six bands on each extremity of many women. These bands on the legs tend to cause varicose veins.

Evening or dress shoes of women with higher heels, which she says do not cause her pain and are very comfortable, may be allowed because we can not

stop them; but not many years ago the female population of the civilized world lamented that Chinese women must have their feet bound so that they must walk on the front part of their feet and toes. Our women now, when elaborately dressed, walk in much the same manner.

Pointed toes are not now quite as much in evidence, but often the shoe is too narrow to give the toes enough room; they are crowded together and corns and bunions occur, with deformities of the toe nails. Much of this sort of deformity occurs with younger children, as their shoes are often not large enough for the rapid growth of their feet.

Very young children may have moccasins or soft shoes, but as soon as they walk around there should be a slight thickening of the heel to give normal tread, and when the child is a few years old a very low heel is of advantage. Man's foot was perhaps designed by Nature to walk bare-footed and the heel is a little more prominent than the rest of the foot; therefore to persist in the flat-footed shoe without a heel is not exactly according to Nature's expectations, and a low heel is an advantage. For older children this heel may be made a trifle higher. The toes of all children's shoes should be broad. There should be no such thing as cramping of the foot or such shortness of the shoes as to cause injury to the toes or deformities.

Rubber-heeled shoes are always a pleasure, and rubber-soled shoes are fine for walking in wet fields, for boating, for tennis playing, and perhaps for some other forms of play or amusement. Nevertheless,

entire rubber-soled shoes for use all day are bad for the feet. They cause perspiration and prevent normal electrical exchange with mother earth, in other words, the person is insulated. Also, these shoes are very heavy, too heavy for a child to wear for any length of time.

Men's shoes are much more sensible than women's shoes, and generally are perfectly comfortable. The narrow-toed shoes so long used by men are now mostly abolished. When these were so much in use men's toes were subject to corns and bunions.

Too large shoes for anyone are a disadvantage, as they cause continued friction by unnecessary movements and sometimes irritations and blistering.

While too much use of rubbers is not healthful, the feet should not be allowed to become wet, and if wet, should be immediately dried. Rubbers should always soon be removed when the person enters a building; one should not sit with rubbers on the feet and especially not with rubber boots.

Bathing and Swimming

A few common sense rules should be noted both in using swimming pools and in bathing in fresh or salt water.

Every child should be taught how to swim, and there is no justification in allowing young boys or girls to go canoeing if they are unable to swim. Even in "flat-bottom row boats" on smooth fresh water there is always the danger of the boy or girl falling overboard.

Diving seems to be a stunt that creates a great

deal of pleasure and enthusiasm. The proper method of diving must be taught, and those who are not perfectly strong physically, whether child, youth or adult, should not dive. It is especially harmful for those who have disturbed circulation or any lung weakness, or have had a sinus or ear inflammation, unless the condition has been long healed. In those who are subject to inflammation of the ear, a pledget of oiled wool may be inserted in the external orifice of each ear. It is hardly necessary to urge that diving requires deep water for safety.

For the sake of others, those who have colds of any type, or discharging ears, or discharges from any other part of the body, or who have a chronic or acute eruption, should not be allowed in swimming pools. It would hardly seem necessary to state that the pool bather must have bathed with soap and warm water before using the public pool; these pools are not bathtubs. It seems a wise provision that the bathing suit used should be one provided by the bathhouse. This insures its cleanliness. Women should wear caps while swimming or diving in a pool. From thirty to forty-five minutes would seem to be the extreme length of time that a person should remain in a swimming pool.

Spitting into the pool, or any other form of contamination of the pool is of course inexcusable. Spitting on the floors surrounding the pool or in the dressing rooms should be prohibited. Also there should be no eating in the immediate enclosure of the pool, as food always means refuse in some form.

It should be recognized that bathing or swimming

in fresh water means generally a greater chilling of the person than in salt water. The shock is greater, and the person should not remain as long in the water. Bathing in cold water is especially harmful for those who are suffering from any form of kidney or lung disease. Bathing or swimming in salt water is more stimulating than fresh water, and the water is more buoyant. Surf bathing is a severe exercise, and is not suitable for weak persons; those who have any circulatory disturbance should never attempt this sort of swimming or even bathing in the surf.

Sand bathing is very popular, and sun baths are many times very valuable, but the head should be protected, and severe burning of the body is not sensible. Too much action of the so-called ultraviolet rays of sunlight is harmful, although a certain amount is of benefit. Tanning of the skin, though inelegant, may be somewhat beneficial. Burning of the skin is never of benefit.

On coming out of the salt water, before the bather dons his garments he should have a fresh water shower for cleaning off the salts deposited on his skin, as they may cause irritation from chafing of the clothing. Soap should not be used. If the water thus used is cold or the air is cold, brisk rubbing should be done to cause a quick reaction.

It is not good sense to remain for a long time in bathing or swimming. Of course the expert swimmer may float and thus rest, but the person benefited by any bathing should feel an after stimulation and not an after exhaustion. It is not well to eat too

soon after coming out of the water, or to go into the water until at least two hours after a meal.

Applications of cold water in some form have long been in vogue by many people. If the reaction from chilling to warmth is rapid they are of benefit, except when there is high blood pressure, kidney disease, or some other condition that would contraindicate the cold. These cold applications vary in intensity from partial cold sponging, complete cold sponging and cold showers to cold plunges.

If one feels chilly after these before-breakfast water treatments, they are not beneficial. However, very frequently, beginning with partial cold sponging and working up to a cold shower, with a feeling of glow after a brisk drying with a bath towel, in a bathroom that is not cold, these cold water treatments are stimulant and cause a feeling of well-being.

Seasons

The least healthy months in the temperate climate are July and August when the heat may be excessive, January and February when the cold may be severe, and March, when a few warm days cause many to be careless and take cold, which may lead to that most frequent disease, pneumonia. Persistent and recurrent rain or snow, with dark days and excessive humidity, are not only physically uncomfortable, but are mentally very depressing. One's work becomes more tiresome with persistently cloudy days. Also many germs that would be killed by sunshine continue to live without it. The weak,

both infants and old people, and those who are ill suffer from excessive heat or severe cold, and more of these persons become sick and die during the extremes of temperature.

To prevent illness in hot weather one should not unnecessarily expose himself to the rays of the sun, and should avoid severe exercise in the heat, when such exercise is not necessary. Many people when on vacations take too much exercise in the sun in the middle of the day, though they are not used to the direct rays of the sun the rest of the year, their work being mostly indoors. Too much lying in the sun, especially at the seashore, is now in vogue. Sunshine is beneficial, but excessive sun heat is harmful, and too many hours of basking in the sun is not advisable, especially for those who are not used to it and have not become protected by the bronzing that regulated exposure to the sun can cause.

During the summer, and especially in dry seasons in the cities, even with careful sprinkling of the streets, the air is dust-laden and, unless the city is very cleanly, is contaminated by decomposing vegetable and animal matter. There is no question of the advantage to city dwellers of living in the country or at the seashore during the hot season. However, it is not always advantageous to change one's comfortable home, with well ventilated, properly screened rooms, and with verandas away from the street, to a location where the outside air is better but where comforts are entirely absent. This is especially true if the new sleeping quarters are crowded, the rooms imperfectly ventilated, and flies and

mosquitoes cause discomfort and possible infection.

The city dweller is inclined to over-do the sea bathing as soon as he reaches the shore. Common sense should be used always in one's pleasures and recreations as well as in one's work and ordinary home life. Many persons, who go on short excursions or trips, are buffeted by the crowds, eat and drink things that may not be clean or pure, and return home exhausted and many times almost ill. The open automobile and the open trolley represent means of obtaining, when the route is correct, good fresh air which will benefit anyone. Speed is not needed, nor is it necessary to follow the beaten paths.

Men are not careful enough to wear thin clothing and air-cooled hats in hot weather. In this age nothing need be said of the air-cooled clothing of the female population. Certainly, from a physiologic and sanitary, if not from a moral point of view, their clothing seems unassailable for hot weather. However, it does seem somewhat absurd that they insist upon wearing fur somewhere about them and winter hats in summer, while they wear straw hats in winter. They will state that they have no more colds or disturbances from cold than do the boys and men who wear more clothing. However, it seems to be a statistical fact, at the present time, that the only class of persons who show an increase in tuberculosis is the young girls. In all other classes tuberculosis of the lungs is on the decrease. It is useless for a physician to chide these girls and advise more clothing, because many times the girl's mother is also under-clothed.

In winter men and boys very generally are clothed improperly for the temperature. Just what they should wear for underclothing depends upon their exposure and their work. No one should be overclothed who is working in rooms or buildings that are warm. An overcoat or sweater should be assumed as soon as these persons go into the outside air. It is a mistake for young men and boys (a common occurrence) to wear sweaters all day. These garments are very warm especially around the neck and arms, and when the man gets home in the evening and dons evening clothes of any type it subjects him to unnecessary change and exposure, especially about the neck, and he is likely to acquire a cold.

Children in cold weather are frequently not properly clothed, some are over-clothed and some are under-clothed. The young child should not have his legs and thighs exposed to severe cold weather. One sees these children going to school, even in the snow, with bare legs, and this is especially true of very young girls who have not only their legs but their thighs exposed to the cold air. This is senseless. Digestion and nutrition are always best when the individual is sufficiently warm.

It is perhaps impossible to cause our females to wear high shoes in winter, but common sense calls for high shoes for all in cold weather, and for rubbers or arctics when it is raining or snowing.

The present vogue of having infants and very young children sleep out-of-doors in cold weather causes inexcusable exposure and is one cause of the

adenoid growths in children's throats, which are so frequent.

Heat.—One or two days of excessive heat, especially if combined with humidity, becomes a menace to infants, and means should be taken to see that these children are kept cool on verandas, in the country or at the seashore. The child should be lightly clothed, have plenty of fresh air, with, if necessary, the use of electric fans, not, however, blowing directly on him. Plenty of cool water should be given the child, and the food should not be too warm.

Hot weather increases the growth of the germs that cause diarrheal diseases, because all foods become deteriorated much more rapidly than when the weather is cool, even though as soon as the foods are received they are placed in refrigerators. Also contamination by flies is more possible in warm seasons. Roof gardens and parks are of great health-giving value in cities.

Air.—Stagnant air in rooms or buildings is what causes depression and reduces the withstand power against disease, and especially is it likely to cause the development of colds. The most important factor in causing the air of a room to be bad is increased moisture or humidity. Carbonic acid gas is rarely increased to any amount that is deleterious, and the oxygen content of the air will remain about the same. Stagnant air is much more depressing than air in motion; therefore ventilation is of enormous benefit, as it causes the air to move.

At the present time great care is taken in school-

rooms to prevent over-heating. Too dry air is not advisable as it tends to dry the mucous membranes and cause irritation. Also very dry air makes the nose and throat more sensitive to any irritant, even to ordinary dust. Therefore a certain amount of moisture in the atmosphere is needed for health, though an over-amount is harmful.

When there is too much moisture the skin can not normally breathe, so to speak. The insensible perspiration remains as moisture or sweat on the skin, and the normal evaporation not taking place the person becomes over-heated.

All schools, most factories, and many workshops, department stores and offices are at the present time properly ventilated. If anyone finds they are not, he has a perfect right to complain and to seek its correction.

Climate

Everyone recognizes the vast difference in temperature, winds, rains, sunshine, etc. of the different climates. It would seem almost self-evident that the physiologic processes and, consequently, the health of an individual are modified by a change of climate. As a matter of fact, the inhabitants of one climate are more or less differently constituted from the inhabitants of another climate. The diet appropriate for a cold climate as compared with that for a warm climate has already been discussed.

The atmospheric conditions vary with the altitude and with the proximity to salt water. Ordinarily, the higher the altitude the colder the temperature; the

lower the altitude the warmer the temperature. Different locations vary greatly as to their humidity, the amount of water vapor in the air; therefore we have dry climates and wet, or moist climates. The higher the altitude and the farther removed from cities the less dust in the air. It is not necessary to travel to great distances to obtain clean air, as slight elevations not many miles from a city may have very clean air.

Many disturbances of the air passages are caused by dust, smoke and noxious vapors, very noticeable in all our city streets. Unless one has a high apartment in a so-called "sky scraper" he must breathe this sort of air more or less all day and night.

Sea air contains more iodine than mountain air. Mountain air may contain many of the cedar elements, which are beneficial in certain catarrhal conditions of the air passages.

One may obtain almost any type of climate within the confines of the United States and her territories, as Porto Rico, Sandwich Islands, Philippines, and Alaska. Heat and cold of course vary with the latitude. The so-called dry climates are well exemplified by the air of New Mexico and Arizona. Climates that have rain only in certain seasons of the year are well exemplified by Southern California. The greatest changes in climate conditions in the United States, perhaps, occur in New England.

Rapid changes of temperature are more or less serious in certain diseases, particularly diseases of the kidneys, diabetes, and some circulatory disturbances, and in advanced tuberculosis of the lungs.

Dry climates are often best for tuberculosis, and a moderate amount of altitude is often advantageous, but tuberculous patients should rarely be sent to a distance, if they expect to return to their homes after the disease has been arrested. If possible, the tuberculous patient should be cured near the region in which he expects to live. The change from a very dry region, or from a high altitude, to a lower, damp region, is likely to cause a recurrence of his tuberculosis.

One with heart disease or high blood pressure should not go to a high altitude; neither should he go to a very cold climate. On the other hand one with an abnormally low blood pressure will fare better in a cold climate and a high altitude. A wintry climate is not advantageous to anyone who is not well. A southern, moist climate is enervating to many patients who are seeking a change of climate for their health; therefore Florida is not always advisable from the standpoint of health. As a popular resort during the northern winter it is most attractive.

Not only all tired persons, but even the well are benefited by a change in climate for a vacation. Theoretically, those who live near the seashore should go to the mountains, and those who live inland and in the mountains should go to the seashore. The seashore and mountain resorts are innumerable.

It should be an axiom that a sick person should not be sent to a distance for climate treatment, if he has not the money ability to be at mental rest, or if he is of the type that would be so homesick that he

will not eat and will not sleep. Mental depression must be avoided, and worry must be avoided. If these can not be prevented, and if the distance to travel is great and the exertion too great in his particular condition, the patient is better at home. Great care should be taken that no one seeks improvement by a change of climate, or a sojourn at some resort, until it is positively known, medically and surgically, that he is not carrying with him some infection or some diseased condition that can be eradicated. All such abnormal conditions should be removed before the patient seeks the benefit of a change of climate. There can be no advantage in carrying an abnormal condition with him, which will persist unless surgically treated.

Frequently one of the advantages in a change of location is that there will be a radical change of diet. Another advantage is the removal of mental tire from the continuance of uninteresting surroundings; anything that elates the patient without too much tire is of great benefit. Also, the hope instilled into the sick by going somewhere for a "cure" is of benefit.

Mineral Springs

While all natural waters contain more or less mineral substances, to be termed a mineral spring, which carries with it the idea of medicinal properties, it should contain 5 grains or more of mineral salts per gallon. Spring waters bottled at the source and sent to distant parts do not have quite the medicinal properties that they do at the springs. Some changes

may take place in their character. This is especially true of those that contain iron, and is always true of those that are found to be radioactive, that is, that contain substances that give off a certain amount of radium emanations.

From the medical standpoint, the mental stimulation obtained by a patient from going to a "spring" and there taking the waters is entirely lost when one takes the bottled waters at home. Also the mineral spring region is always a different climate from the home climate, and there is generally a complete change of food, more or less sunshine treatment, and more graded physical activities, such as walking. In other words, going to a "cure" is of much greater value than taking the same mineral spring water at home. In fact, the value of spring waters as curative agents is very much over-rated. If one needs these particular salts that the spring water contains, they may be administered medicinally. However, it can not be gainsaid that some of the natural combinations of these mineral salts seem to act more satisfactorily than when the same salts are administered as drugs.

Radium and certain radium salts have very active properties when applied to animal and even vegetable bodies. Radium can stimulate growth or inhibit growth. It can stimulate healthy reactions and inhibit unhealthy reactions; or, on the other hand, when carelessly administered, it can destroy tissue and even cause death. Radium emanations in certain industries, where radioactive substances must be handled, have been found to be dangerous

to life, causing incurable anemias, and also inhibiting functions and actually destroying tissues.

Almost any water contains a small amount of radioactive substance, and some mineral waters contain considerable amounts of these substances. It is quite probable that these waters, drunk at the source, may be of benefit in certain conditions. On the other hand, they may not be harmless in other types of disease.

The activity of radium and radium substances is exploited by some nostrum firms. They play on the credulity of those who are ill and charge enormous prices for these preparations, which almost invariably contain, if any, such a minute amount of radio-activity as to be less than contained in the patient's home drinking water. These preparations and their promises of cure are fakes.

Spring waters are divided principally into alkaline, cathartic and iron waters. The cathartic waters contain mostly magnesium sulphate (Epsom salt) and sodium sulphate (Glauber's salt) as well as other minerals. Cathartic waters are best drunk warm, and before breakfast. In very many conditions such waters are not advisable and may do harm. Iron waters are of course constipating, but they may be a very valuable way of administering iron. Generally such a water is not necessary as iron is so readily administered medicinally or by food.

The alkaline waters are used mostly as table waters, and are generally most pleasant when they are sparkling with carbon dioxide gas. Some springs are sparkling at the source. Other waters are made

effervescent artificially. The best known alkaline water is Vichy, which is really the title of a type of water. We have the imported Vichy and the Vichy of the Saratoga Springs, New York. Kissengen water also comes from one of the springs at Saratoga; it is faintly acid. Besides these two waters, used for drinking purposes at the home, are the White Rock, which comes from Wisconsin, the Poland Spring water, from Maine, and the imported Apolonaris.

Not far from eight hundred thousand gallons of bottled waters are imported into the United States annually, and probably twice that quantity of water bottled from our own springs is drunk in this country.

Many of these mineral waters contain salt (sodium chloride). Some calcium waters ("hard" waters) contain a large amount of lime, largely the carbonate. Sulphur waters occur more especially at some of our hot springs. These waters are not only laxative, but are supposed to have properties that are of benefit in rheumatism and neuritis. A few springs contain arsenic, which, as well as many of the other medicinal waters, should not be drunk without medical advice. The so-called lithium waters are of very little value except for the amount of water that is drunk. In other words, lithium does not aid in dissolving gall-stones, kidney stones, or in the cure of rheumatic conditions. The water that can cause the greatest amount of solution of salts and minerals in the body is distilled water, which contains no salts whatever.

At many of these springs are located sanatoria where a person coming for treatment is carefully

examined and then advised as to the régime and cure that he should take. Many of the hot steam baths and baking processes are inadvisable in a given case, and it is generally wise for a person who seeks these spring treatments to have his family physician carefully examine him before he undertakes one of these "cures." Too much is often done to ill people who seek treatment at these institutions. Over-treatment of any kind is always harmful.

One need not visit Europe for spring or spa (the European term) treatment unless he so desires. The following is a list of some of the medicinal springs of the United States:

Poland, Maine
Saratoga, New York
White Sulphur, Sharon, N. Y.
Clifton, New York
Richfield, New York
Dansville and Watkins, New York
Mt. Clemens, Michigan
Hot Springs, South Dakota
Bedford, Pennsylvania
Hot Springs, Virginia
Chalybeate Springs, Virginia
White Sulphur, West Virginia
Hot Springs, Arkansas
Glenwood Springs, Colorado
Sulphur Springs, Pasa Robles, California.

Chapter VII

The Mouth

Teeth.—Normally, the teeth of a child erupt about as follows: The lower central incisors in about seven months; the upper central incisors in about ten months; the upper lateral incisors soon after the upper central incisors; and the lower laterals in about twelve months. All four first molars come at about the end of the first year; next the four canines (cuspids), the so-called stomach and eye teeth, are erupted in about twenty months. The four second molar teeth, the child's back teeth, are erupted in about two and a quarter years. These twenty teeth are the so-called "first" teeth, and are all deciduous and will be lost.

The first permanent teeth are termed the six-year molars, and are erupted at about six years of age. The rest of the teeth gradually erupt, until at about fifteen years of age the boy or girl should have all of the permanent teeth complete, except the four "wisdom" teeth which erupt much later. These are the back, the third molar, teeth.

There have always been so-called *impacted* teeth. These may occur in any part of the jaw, due to being misplaced, or because the jaws are too short to allow room for the proper eruption of the teeth, a tooth now and then butting into another tooth and becoming impacted. The most frequently impacted teeth are the third molars, the wisdom teeth, and during the last twenty years these impactions have been on the increase. The human jaw seems

to be decreasing in length, and the third molar teeth frequently do not have room to erupt, become impacted, and sooner or later often cause trouble by pressure on the second molars or on some nerve. These unerupted teeth may become infected. Any symptoms occurring from an impacted tooth means that it must be removed. If the second permanent molar tooth, next to the impacted one, is not in a healthy condition, that may be removed to give room for a more healthy third molar, if x-ray pictures decide that such a procedure is wise.

Normal eruption of teeth and normally placed teeth are essential for normal development of the face and jaws. When there is adenoid tissue in the upper part of the throat, back of the nose, that obstructs normal breathing through the nose, the upper part of the face and the nose do not properly develop and room for the teeth in the upper jaw becomes insufficient. The face becomes flattened, the nose small, and the bridge of the nose more or less depressed. These large obstructive adenoids should be early recognized and early removed, that they may not be a cause for the imperfect development of the child's face. Also, it must be ascertained whether there is any obstruction in the child's nostrils, which would prevent him from properly breathing through them and consequently impair his nose development. Mouth breathing, snoring at night and sleeping with the mouth open are all indications of some obstruction in the upper air passages. Diseased tonsils should be removed at the time the adenoids are eliminated.

It seems to be a fact that if an infant nurses normally his mouth, jaws and cheeks better develop. Bottle sucking does not develop the mouth and jaws as well, possibly because the milk flows too easily. A child should not be allowed to go to sleep with the nipple in his mouth or with his thumb in his mouth. Thumb sucking is especially harmful after the front teeth are erupted, as it tends to deformities, causing the upper teeth to protrude outward and the lower teeth to be bent inward. Older children cause facial deformities if they lean their heads on their hands in studying.

Nothing causes deformities of the teeth more than what is termed malocclusion, that is, the imperfect application of the lower teeth to the upper. A very large percentage of all people have poor occlusion. Poor development of the face and jaws will cause this condition, and if there is malocclusion the deformities tend to become general. Proper mastication develops the jaws. Also for their proper development it is essential that the first (deciduous) teeth remain long enough to allow the jaws to grow, but not long enough to cause the underlying permanent teeth to be deflected and present themselves in abnormal positions. Toward promoting the former condition dental decay of these children's teeth should be watched for and treated by a dentist. A decayed tooth is always a menace; therefore it must be filled with some simple material to preserve the tooth as long as it is wise to preserve it. However, a tooth that has become badly decayed may harbor germs and be a cause of infection, especially

rheumatism. Also the root of a child's tooth may become infected and be a cause of heart disease or some other disease. Consequently, x-ray pictures must be taken by the dentist to determine what shall be done to a child's tooth, if it seems to be in serious condition. Certainly, a tooth cavity should not be filled and then it be shortly afterwards found that the root is infected. The most serious results occur when the six-year molar is removed, of which the child (after seven years) has four, one on either side of the upper and lower jaws. These teeth should be very carefully watched, and if decayed, preserved if possible, as, if they are not preserved, the jaws do not develop, the face becomes deformed, and often the upper and lower jaws do not properly meet, especially in front. Early loss of these teeth accounts for the flattened face, depressed nose, the projecting or retreating lower jaw, and various other facial defects seen in youth and adults. If one or both six year molars are early lost, on one side only, the face becomes asymmetrical.

If in spite of the care above advised deformities of the teeth occur, the child must be taken to an orthodontal surgeon, that is, a dentist who is specializing in the work of preventing deformities of teeth and mouths. With some deformity developing, the younger the child when taken to such a dentist, the more successful will he be in causing the teeth to become straight and the mouth normal. Abnormal development of the mouth and especially of the front teeth, can cause defects of speech, especially of the letters that are associated with the proper closing

of the mouth and then allowing the air to quickly escape from between the lips. Also developmental deformities of the arch of the palate may interfere with the normal speech sounds.

A child who has been a mouth breather for some years, due to neglect, finds it difficult to breathe properly through his nose, even after the obstruction has been removed. The habit of mouth breathing once formed is hard to abolish, and the parents must constantly remind the child to breathe through his nose.

Other faulty habits may cause deformities of the front teeth, as biting the lips, chewing and sucking things, and biting the nails.

As soon as the child has teeth that come together, he should be given some food to chew. It is a mistake to give a child too soft foods. Food deficient in calcium and phosphates causes poor development of the jaws, and, when this privation is carried far enough, the disease of rickets occurs with its many bone deformities. Imperfect development of the back part of the palate and of the region back of the nose may cause deformities at the mouth of the Eustachian tubes, which lead to the inside of the ear, and cause ear trouble, and perhaps, later, defective hearing.

Rapid decay of the teeth may be due to some inherited disease; to poor nutrition; to some endocrine gland insufficiency, especially the thyroid, thymus, pituitary, or parathyroids; or to an abnormal saliva. The saliva should normally be slightly alkaline or neutral in reaction; if it is acid

it is abnormal. The mouth secretions may be acid from some mouth infection.

Inherited syphilis interfers with the development of normal teeth. Serious sickness may so lower the nutrition as to prevent the teeth from being healthy. Crowded teeth, too widely spaced teeth, pigmented spots on the teeth, ragged edged teeth, and imperfect enamel may all be due to disease or over-action of some endocrine gland. Children with poorly developing, or bad, unhealthy looking teeth, should be studied by the family physician in consultation with an orthodontist. Too much sugar often causes unhealthy mouths. On the other hand, the child requires some sugar, in small amounts after meals.

As soon as the teeth have erupted, the mother must cleanse them either with a soft cloth or with cotton moistened with some simple solution, as milk of magnesia. As soon as there are many teeth, a toothbrush, or better a substitute for the bristle toothbrush, should be used. If the child does not take much milk he must be given lime in some other form. Fruit, especially orange juice, is always of advantage to the young child, and cod liver oil, with its vitamins, is an aid in preventing rickets and decay of teeth. Some endocrine gland treatment may be needed.

Careful investigation in schools has shown that ninety per cent. of children of school age have decayed teeth, or their mouths need attention.

Mouth Infection.—Though the study of mouth infection as a cause of disease is more or less recent, it is only such because physicians and

dentists have for many years neglected to utilize the knowledge that was historical and should have been sought and studied. In 1801, Doctor Benjamin Rush of Philadelphia, a very noted physician, described the case of a woman who had rheumatism of the hip joint which was not cured until she had a decayed tooth removed. He also described the case of a woman who had dyspepsia which was relieved by extraction of a tooth; and of a man who had epilepsy which was cured by having a number of decayed teeth extracted on his advice. He stated (1801) his belief that if physicians would study the mouths of their patients, especially in chronic disease, and remove diseased teeth, the patients would be very much benefited.

Malocclusion of teeth in youth and adults is one cause of injuring of the roots of the teeth, that is, if a tooth is too long it hits the opposite tooth before the others on that side come in contact when a bite is made. When this is daily repeated injury occurs at the tooth root, which becomes sore and later infected, preceded by inflammation of the gum. Every loosened tooth is generally such, because pus pockets have formed at the sides of the tooth, and it becomes an abomination, as every time mastication occurs pus is exuded into the mouth and swallowed with the food and drink.

Every dead tooth is a menace, and a tooth dies because it is devitalized by a dentist, or from injury, or it dies from over-filling, by the metallic action of the substances used. If a tooth dies, its pulp canal

putrifies and sooner or later this causes infection of the root.

When a diseased tooth is extracted, the diseased area around the socket must be completely removed, else the operation is imperfect and infection will persist.

Pyorrhea is of very frequent occurrence in adults after forty years of age. The primary cause of pyorrhea is an injury to or inflammation of the gums between the teeth or at the junction of the gums with the teeth. Lack of mouth cleanliness can start the condition. Deposits on the teeth, at the junction of the gums, of what is termed tartar, due to not visiting a dentist sufficiently often, is the most frequent cause. This tartar becomes infected, and the inflamed gum can not heal as long as the tartar and the irritation from the tartar remains. Therefore, the preventive treatment of pyorrhea is the removal of all tartar, and the cleaning of all pockets by a dentist.

As stated, injury to a gum may be a primary cause of a localized inflammation and subsequent pyorrhea. The gum may be injured by a bristle toothbrush or a loose bristle; by toothpicks or dental floss carelessly used; by ill-fitting crowns; by some foods that carry irritating substances such as popcorn, when the sharp shell may be pressed between the gum and a tooth and remain there; even such a simple substance as shredded wheat biscuit, if it is not properly softened, may pierce a gum and cause inflammation; and specks of bone in chopped meat may prick and cause an injury. After an injury has

been caused and inflammation develops the germs that are always in the mouth attack the region, and disease-producing germs are later found in these pockets. The ordinary bristle toothbrush transfers infection from one part of the mouth to other parts, and the toothbrush becoming infected and, if not sterilized, will grow these germs and put more into the mouth on its next use, and so on day after day. Substitutes for the bristle toothbrush can be obtained. The rubber brush can be sterilized; the cotton pledgets of the Re-Vira equipment are used but once.

Many cases of simple pyorrhea may be cured by proper, persistent treatment, but if the disease has dipped down deep along the side of the root, the tooth can not be permanently saved. If the attempt is made and the patient subjected to long experimental work, the tooth still, almost invariably, must be extracted later. Ill-fitting crowns and fixed bridges, which pull on the abutment teeth, sooner or later cause infection of the roots or of the gums of the afflicted teeth. A dead tooth can not tell that it is in trouble; its nerves, that is, its wires, have been cut and it can no longer send messages.

A child's full set of teeth consists of twenty, while the adult's full set consists of thirty-two. Any one of these teeth may become decayed and carry germs, or may have disease at its root and be infected.

Several types of germs may occur in an infected mouth and cause different symptoms. The germs or the toxins that they produce are absorbed into the blood or lymph channels of the body. The most

serious conditions caused by certain types of germs, which occur both in gums and tonsils, are rheumatism and heart disease. The same germs may cause chorea (so-called St. Vitus dance). Other germs carried in the mouth may cause what is termed chronic arthritis with deformed joints. Others may cause boils and various types of skin eruptions. A most frequent occurrence from mouth germs is neuritis, especially of the arms and back of the neck. They may cause sciatica and lumbago, and the lower part of the spine may become infected and give symptoms similar to joint rheumatism in the extremities. Ulcer of the stomach, appendicitis and infection of the kidneys can come from germs carried in the mouth.

In discussing mouth infections we must always also consider infected tonsils, adenoids and infected sinuses. The frontal sinuses located between the eyes just above the nose and the antrums located on either side of the face are often infected. Also infection may penetrate into the upper parts of the nostrils and the ears may become infected from mouth and throat diseases.

A dead tooth is always a menace and never can be considered safe after it has been dead for two months. Even when a tooth has been devitalized by a careful dentist and its canals have been filled for the purpose of preserving it from infection, still this tooth, as stated, after two months or more, when extracted and the canals opened and the tooth cultured in the laboratory, will generally be found to contain harmful germs.

X-rays are now taken to decide the condition of the roots of teeth. If much inflammation is present or much degeneration has occurred, the x-ray will declare it. On the other hand, a tooth may have infection at the end of a root or in its canals and the x-ray picture not show it. The x-ray picture can not show that the tooth has died unless an infective process has occurred at the root. The x-ray can show deep pockets of infection down between the teeth, when they can not always be discovered by the dentist by simple observation.

If these infections at the roots are shut in they may not show any symptoms on the gums, and frequently so-called "prophylactic treatments" of cleaning the teeth and treating the gums may make the mouth appear healthy, while dead teeth, crowns, bridges, pivoted teeth and poorly placed bridges may be carrying infection which is being absorbed into the body and doing harm. Some individuals are very susceptible to these germ poisons; others become tolerant to them and develop what may be termed an immunity, but this immunity is likely to break down when any disease or serious condition happens to the person, whether it be influenza, pneumonia, appendicitis, or some serious injury. In other words, these individuals are carrying around pieces of "dynamite" that may at any time explode and cause more or less serious harm.

Those who have open pyorrhea, which oozes into the mouth and is mixed, chewed and swallowed with the food, can *only* be excused for harboring such infection by the supposition that they are ignorant

of the condition. One would not suggest to an individual that a suppurating finger be sucked and the pus swallowed, but that is what is being done by those who have pyorrhea.

The menace of this open infection to others must be considered. These infected persons may kiss children, or exchange drinking glasses or spoons, or wipe their mouths with their fingers and then shake hands with some one, or wipe their mouths and then contaminate all sorts of things, furniture, and different household articles. It can easily be understood that such persons are a menace and that pyorrhea must be eradicated for the sake of others.

One should not be surprised to learn that it has been scientifically determined that bacteria are found on the hands, and especially on the fingers, and may be transferred from one person to another by handshaking, even to the fifth person.[2]

A very frequent infection is *Vincent's disease*, or "trench mouth." Sometimes in this disease the gums are very tender, which causes the person to seek help. At other times he may be a chronic carrier of this infection for many, many months and may transmit it to others, as it is very contagious. This infection causes loosening of the teeth, and may cause very serious disease.

Any infection in the mouth may injure the thyroid, the goiter gland. Mouth infection may also disturb other glands and cause various types of symptoms, may cause serious blood disturbances, and may even cause sugar to appear in the urine.

[2] Pub. Health Jo. 19: 426 (Sept.) 1928.

Infection having been found in the mouth and x-ray pictures having been taken and a decision made as to which teeth are dead or infected, there can be no intermediate ruling. All dead teeth must be extracted. All teeth that show infection so deep down at the roots that they can not be cured must be extracted. There is no other safe procedure, and, at the present time, there is no known way to preserve an infected tooth, whether by treating the root, or cutting it off or by sterilizing it. These teeth must come out, and there is no such thing as the "worst tooth." A tooth that looks the worst in the x-ray picture may not cause as much harm to the body as one that is dead but looks harmless in the picture.

Pyorrhea must be eradicated as fast as possible, and proper treatment may save the majority of pyorrhea teeth; but the treatment must be persistent. Many of these pyorrhea mouths carry pneumonia germs, and this is one of the reasons that when a person has a mild cold or a mild attack of influenza pneumonia so readily develops. It is one of the reasons why measles is more dangerous in an older individual than in a child, because the older person more frequently carries dangerous germs, especially pneumonia germs, and measles allows the pneumonia germ to be absorbed and cause that disease. Some of these infected mouths cause high blood pressure and some germs cause low blood pressure. In very many instances, cleaning the mouth of infection will render the blood pressure normal or nearly normal.

Besides what has been enumerated as to the diseases that may be caused by mouth infection, recurrent colds are often an indication of such infection, and frequently the tendency to colds is cured by the removal of infected teeth.

Bad breath (halitosis) is caused by pyorrhea, dead teeth, decayed teeth, dirty bridges, fetid crowns, and especially by infected tonsils.

Bridges and crowns that rest on the gums and pivoted teeth often cause a bluish discoloration of the gums. When these teeth are extracted there is frequently found a greenish discoloration of the roots, and the odor from these infected teeth after the bridges and imperfect crowns are removed is fetid.

It is self-evident from what has been said that a physician must examine his patient's mouth, and, if deemed necessary, have x-ray pictures taken and carefully study them in consultation with the dentist. There is no excuse for not removing mouth infection, as infection in the mouth harmless to-day may cause serious systemic trouble to-morrow.

A dentist who notes infection in the mouth should not only properly treat it, but should suggest that the individual consult his family physician, so that insidious disease, either caused by the mouth infection or by some condition that increases the susceptibility of the patient's mouth to inflammation and infection, can be discovered and treated. If the dentist discovers several points of infection in a person's mouth he should, as soon as possible, eradicate *all of it*, not do one part to-day and another

part a week or two hence and so on, thus prolonging the period of danger of serious consequences to the individual.

Before any repair work is done in a patient's mouth all of the teeth should be thoroughly cleaned and the mouth made sanitary for the repair work. Who would put new pictures in a room and clean it afterwards? It is *impossible* for a dentist or anyone to decide which infected part of the mouth is the most serious. *All* infected regions and teeth should be cleaned up or removed. The dentist has no right to declare that the infection in a patient's mouth has "nothing to do with the symptoms in some other part of his body." He does not know. Neither should he make the statement, "I will extract these teeth, but it will do no good." Whether or not a diseased area in some other part of the body is cured by removing infection from the mouth has nothing to do with the danger of carrying such infection. Extracting a diseased tooth can not remove the inflammation in the distant part. That other part must be treated until it has recovered, if recovery is possible.

At the present time there is no justification for devitalizing a tooth, and any dentist who does such work is open to severe criticism.

When crowns, pivoted teeth, or close-fitting bridges are removed the odor released is often putrid. Such disgusting odors are produced by bacteria, and the products of such decomposition in these closed cavities are absorbed into the blood and do harm. Most animals, and the human animal is no exception,

determine the character of their food by the odor, and putrescent food and putrescent drink are abhorrent to the human race. In other words, our sense of smell helps us in selecting our food. Therefore, why should we harbor such putridity in our mouths?

To sum up, pivoted teeth, crowns to the gums and bridges lying close onto the gums are a menace to health. Infection sooner or later almost always occurs in the regions of this repair work. Such repairs may be beautiful to-day, but pitiful in a few years. The problems the dentist has to-day are vital problems, life and death problems. The dental specialist has been exalted to a high rank in the medical profession, and it is for him to decide whether or not he will live up to the standard set.

Now to look at the other side of the question. Too many teeth are extracted without local or general excuse. Teeth should not be extracted if the infection can be otherwise eliminated. It is self-evident that all sepsis and pathogenic foci in the mouth should be removed. Success in this field demands more frequent consultations between the dentist and the family physician. The physician should not peremptorily order one or more teeth extracted, nor should the dentist extract the teeth of a person, who is found by questioning to be under the care of a physician or in need of medical care, without consulting with the physician who has examined the patient. The removal of teeth is a surgical procedure, though generally a minor one, that requires cleanliness before operation, skilled technic and, if there is infection and suppuration,

careful and untiring postoperative care. The surgical treatment of a mouth, that contained pus, after the extractions should be the same as that of any other part of the body that contains pus.

THE TOOTHBRUSH.—This instrument has been elevated by civilization to the dignity of a commandment, and it is almost sacrilegious to dethrone the toothbrush from the pedestal upon which it has been placed. Toothbrush talks and "toothbrush drills" are a part of almost all school curriculums. The toothbrush drill has in some cities and towns been abolished because the children must bring their toothbrushes to the school, go through the drill, and then take them home again before they can be properly cleansed. Such handling of a toothbrush has been pronounced insanitary. This is especially the fact as a certain percentage of all children in every school are carrying some sort of mouth infection, as colds, infected tonsils, decayed teeth, or sore mouths.

At the present time there are at least eighty types of bristle toothbrushes on the market, giving a very wide range of choice of size, length of bristles, closeness of bristles to each other, irregular brushing surfaces caused by different lengths of the bristles, etc., etc. Nevertheless, there is no good, healthy toothbrush after it has been once used, unless it has been sterilized, and most methods of sterilization soften the bristles and ruin the brush. Even a properly sterilized bristle toothbrush is a menace on account of the injury it may cause the gums by pricking. Also it is a menace because it can transmit

from one part of the mouth to another any infection that may be located between the teeth or in any decayed part of a tooth, or in any sore spot.

A few years ago government reports showed that there were about 30,000,000 toothbrushes annually imported into this country, while 10,000,000 were manufactured here, making the annual sale of toothbrushes 40,000,000.[3]

The toothbrush has been declared by many dentists not only not to be able to prevent pyorrhea, but actually to be a cause of it, by injuring the gums and carrying infection. A perfectly sterile bristle brush after once being used, even if washed very many times with running water and then hung in a bathroom or other place, will show a growth of germs in twenty-four hours. It has been shown that if the brush is put in a closed receptacle, it will grow more germs. It has been urged that the bristle brush be hung in the sun; this in the city and during rainy seasons of course can not be done. It has been suggested that the brush be sprinkled with salt and then left for twenty-four hours, and that each individual should have three brushes in use at one time, using each one once in twenty-four hours. Nevertheless it is found impossible to keep the bristle toothbrush clean, unless it is hung in a closed receptacle containing the vapor of formaldehyde.

It is a fact that in spite of the enormous use of toothbrushes by civilized communities, pyorrhea has increased instead of diminished, and there is proof that in parts of the world where the toothbrush was

[3] Asgis, A. J.; The Amer. Dental Surgeon, Oct. 1927.

unknown and then later introduced, it has caused more diseased gums than occurred before this innovation.

Substitutes for the bristle toothbrush are now offered. One of the best is termed "Re-Vira," and consists of compressed pledgets of cotton which are inserted into a holder; each pledget is used once and then thrown away. Another substitute is a rubber toothbrush, which can be cleansed with very hot water; or the rubber part may be detached and boiled. One of the best forms of this brush comes in the "Pearl-Mint" package. If one's mouth is free of disease and a harsh bristle brush is enjoyed the "Tefra" type, with its removable small brush, which should be frequently replaced by a new brush, is the best.

How to Preserve the Teeth.—1. The infant's teeth will normally erupt, if the child has the right kind of food and if the thyroid (goiter gland) and other glands are normal.

2. Adenoids in the upper and back part of the throat and diseased tonsils interfere with the growth and health of the teeth. Malocclusion is a frequent cause of deformed and diseased teeth.

3. As soon as the teeth erupt the mother or nurse should gently cleanse them, at least twice daily, with pledgets of cotton moistened with milk of magnesia.

4. As soon as the child is old enough to clean his own teeth he should be given compressed cotton pledgets for use at least twice a day (the Re-Vira equipment). The cotton pledget after insertion into

the holder should be softened with milk of magnesia, or with water, and a non-soapy tooth powder used. After use the pledget is thrown away and a fresh one used for the next cleansing of the teeth.

5. The bristle brush is insanitary and always carries food particles which putrefy. It easily becomes infected and distributes this infection to different parts of the mouth in pyorrhea, in canker and other sores of the mouth, in Vincent's disease ("trench mouth"), when teeth are decayed, and after extraction of a diseased tooth. It must generally become contaminated in tonsillitis, influenza, diphtheria, mumps, measles, scarlet fever, rheumatism, pneumonia, typhoid fever, tuberculosis, syphilis and in all septic infections.

6. If in spite of the advice to the contrary a bristle toothbrush is used, it should be discarded during illness and during any inflammation or abnormal condition of the mouth, even during a cold. Later, it should be either sterilized or destroyed. The sterilized or new toothbrush should not be employed until the acute disease has passed. During his illness the patient should use, or have used for him, some cleanly, sterile toothbrush substitute.

7. The teeth should be cleansed at least twice a day, on arising and before going to bed. If this is done with a bristle brush, a tooth paste, not too soapy, should be used. If a compressed cotton substitute is employed, a non-soapy tooth powder should be the one selected. Boric (boracic) acid may be used on the brush or other tooth cleaner as a mild antiseptic.

8. After each meal (when possible and when alone) dental floss or a good wooden toothpick should be gently used (not to injure the gums) to remove particles of food lodged between the teeth. The mouth should then always be rinsed with some mild cleansing fluid or with plain water. One-quarter of a teaspoonful of salt and one-quarter of a teaspoonful of soda, either one or both, added to half a glass of warm water makes a soothing and cleansing solution for the mouth and teeth.

9. Each adult should see his dentist at least once in two months for thorough cleaning of the teeth to prevent decay, and better health will be maintained and many diseases will be prevented.

10. At any age, for the preservation of the general health and of the teeth, the food must contain the proper amount of iron, calcium, phosphorus and vitamins.

11. All dead teeth, badly fitting crowns, and poorly constructed bridges are a menace to the general health and to the health of the other teeth. Every dentist observing diseased teeth or gums should urge the individual to see his physician; and every physician who notes abnormal conditions of the mouth should send the patient to a reliable dentist for the eradication of disease and for the promotion of health.

12. Once a week the teeth should be manicured. They are very much more important than the nails. This manicuring may be done with an orangewood stick with a very small pledget of cotton wound on the end, dipped in peroxide of hydrogen solution

and then inserted between the teeth and around the edge of the gums. The cotton must be frequently renewed. Next a pledget of cotton on the end of an orangewood stick, moistened with water and dipped in "Kuroris" tooth cleaning powder should be used. This is a dry powder made especially for this purpose. After this the mouth should be washed out with some simple mouth wash. If this toilet of the teeth is done once a week the formation of tartar and the development of pyorrhea will be prevented.

Tonsils

The tonsils consist of glandular tissue and are located one on each side in the back part of the mouth. Their main function seems to be to catch the germs of disease and render them harmless. In doing this work they may absorb enough germs to become diseased themselves, being unable to kill all they acquire. The result is infected tonsils. Rarely is one infected without the other being in the same condition, although generally one is worse than the other. Tonsils readily enlarge in children and become obstructive, so that breathing is somewhat impaired and the speech is muffled or abnormal.

The tonsils contain a number of indentations or crypts which normally send out a thin secretion. These crypts easily become inflamed and may produce little cheesy masses that are retained for a time as plugs. These cheesy, pusy deposits become very bad smelling, are often causes of soreness in the throat, and always cause more or less bad breath. Proper treatment by a throat specialist may eradi-

cate the deep crypts and prevent the tonsils from becoming badly infected. Such tonsils may of course be retained. Merely enlarged tonsils, unless they are obstructive to the child, should not be removed. As the child's throat grows there is more space for the tonsils, and, also they may shrink and grow smaller in size. In other words, the tonsils should not be removed, if they consist of healthy tissue or if there is only a surface infection that can be cured.

Diseased tonsils most frequently give the indication of this condition by causing recurrent tonsillitis, that is, fever, sore throat with swollen tonsils and little pin points or specks of white exudate scattered over them. This condition is an acute infection, is contagious, and requires active, proper treatment. Such types of tonsils may be the forerunner of *acute rheumatism*, with or without the serious complication of heart disease. In other words, acute inflammation of the joints and acute disease of the heart most frequently start from the tonsils. *Chorea* (St. Vitus dance) is very closely related to rheumatism, and also, frequently, proceeds from diseased tonsils. *Quinsy* means an abscess of a tonsil, and when a tonsil has shown this type of inflammation it is so diseased that it must, ordinarily, be removed; and, as stated, when one tonsil is diseased the other is usually also diseased.

At the present time acute articular rheumatism is in most regions less frequent than formerly, probably because diseased tonsils are now more frequently removed in children; and it is the children who suffer most frequently from acute rheumatism

and subsequent valvular disease of the heart. Anything that will prevent this permanent heart defect is the proper treatment.

There is a good deal of talk about the harmfulness of removing tonsils. As above stated, there is no question that tonsil tissue has a function, but diseased tonsil tissue is a menace. Diseased tonsils and diseased teeth seem to be correlated; one seems to be able to cause the other, and a person is not without danger of some permanent or serious condition developing if he is carrying diseased tonsils or diseased teeth. Diseased tonsils may cause neuritis, as well as can diseased teeth. They also cause types of joint inflammation other than acute rheumatism, and may cause boils and pus eruptions on the body. It is not infrequent to find more or less seriously diseased tonsils in one who has never had what is termed a tonsillitis. This is especially true of older persons, but generally there is a history of having had tonsil attacks, one or more a year, for many years, and then finally a cessation of these attacks. Occasionally such tonsils have cured themselves, but that is rare.

Lingual Tonsil.—At the base of the tongue just above the larynx is tonsil tissue which is termed the lingual tonsil. This gland tissue frequently becomes irritated, swollen, inflamed and coated. It may occasionally become infected. This swollen tissue causes a tickle, and many of the spasmodic coughs, and coughs that occur in showers, are due to irritation of this tonsil. Such a cough has often been attributed to an elongated palate, and uvulas

have been clipped, without helping this condition. Cough medicines are of little value, but local applications are of benefit. This kind of cough is frequent with cigarette smokers, but it often occurs in non-smokers. Besides the tickling and the severe coughing without much expectoration, this type of cough is characterized by being precipitated by any change from cold air to warm, or from warm air to cold, or by laughing, loud talking, or by swallowing some irritating liquid or food. Such a cough requires local treatment by a physician.

Adenoids.—So-called adenoids consist of glandular tissue located in the upper part of the throat back of the nose. Enlargement of this tissue is of very common occurrence in young children, in fact, few young children seem to be free from it. An over amount of it, even if not large enough to interfere with breathing, causes so much secretion in the throat that these children often wake up at night strangling and coughing. If the growth is large enough to cause obstruction in the back part of the nose, the child can not well breathe through his nostrils, and he becomes a mouth-breather and snores when he sleeps. He also drools.

The secretion of this excessive glandular tissue is depressant to the child and seems to interfere with his general health, and often with his growth. Besides this action on his system from absorption, when the child can not well breathe through his nostrils his nose and face do not normally develop. The face has a flattened appearance and the voice is what is termed nasal, that is, the voice does not have the

timbre of free breathing through the nose. The lack of normal development of his face causes malformation of his jaws, and his teeth poorly develop and are deformed. In other words, the condition is serious for the child, and such adenoids must be immediately removed.

Some children, even with a small amount of adenoid tissue, have frequent colds and often have trouble in their ears, due to inflammation of the Eustachian tubes and consequent lack of proper ventilation in the inner ears through these tubes. The Eustachian tubes are air canals from the back part of the throat to the inner ears. The improvement in these children after removal of this adenoid tissue is sometimes astonishing.

It is hard to determine why, in the present era, the majority of young children have adenoid growths. One reason may be that they are foolishly exposed to too much cold air. They are supposed to be "hardened" by sleeping out of doors. They are allowed to breathe too much dust and too much cold air and often air that is contaminated with gasoline odors. The "hardening" process is too severe.

Lymphatic Glands.—There are very many of these glands of varying sizes located throughout the body, both near the surface and on the inside of the body. Those that most interest the layman are the ones that are located on both sides of the front of the neck.

These glands readily enlarge from any mouth or throat infection, and especially when tonsils become diseased, and may enlarge from different kinds of

general infections and from some blood diseases. Some diseases cause their enlargement, but do not cause them to suppurate or become abscessed. Other infections, notably scarlet fever, may not only cause these glands to swell, but also to go on to abscess formation.

Tuberculosis often attacks these lymphatic glands, causing a development of cheesy substances and, perhaps later, pus. Pus must be eradicated, but whether or not enlarged glands should be removed must be decided by a physician or surgeon.

The lymphatic glands are little fortresses that are garrisoned by a large number of lymph cells. These cells are ready to fight infection and kill bacteria. If the infection is local, as a diseased tonsil, or if the infection is tonsillitis, diphtheria, or scarlet fever, the nearest glands to the diseased part are the first ones affected, and they become enlarged in doing this extra military protective work. If the first gland of the chain of glands is not able to overcome the enemy, then the next gland or fortress takes part in the fight, and so on, if the fight is a losing one, until the whole chain of glands is involved. If a gland becomes so diseased that it harbors infection and has not been able to eliminate it, it is of no further use as a military fortress. Whether or not this gland should be removed depends upon the medical decision.

Whenever a gland of the neck or elsewhere is found enlarged a physician's opinion should be sought. Enlarged glands are indicative of many diseased conditions all of which require medical attention.

Chapter VIII
The Child

The so-called "nervous child" has become to-day quite a problem. The cause is really the speed of the lives of the parents and near relatives, as the child soon observes and partakes of their strenuosity, especially in cities. The child is even born with the increased irritability and high-strung condition of his mother. She has not rested enough during his gestation, either because she has not had sufficient help to allow her to have rest periods, or she is too strenuous in her social engagements and her automobile life.

The regularity of the care of the new-born infant to-day is splendid. Regular feeding and regular times of holding or airing the child are commendable. However, it must never be forgotten that even infants are individuals, and one infant can not be treated exactly like another infant. They have little individualities almost from the start, and develop these individualities very markedly as they become young children. Of course it is not advisable to rush to a child every time he cries. On the other hand, the cause of the crying should be investigated; there may be a tangible reason. Frequently the child is receiving insufficient food or incorrect food, and he suffers from hunger or from indigestion. The child may be too hot or too cold, or, what is very important, he may be thirsty and need water. He may be very uncomfortable from untimely calls of nature; and he may have skin irritations in most any

part of his body that cause him to be restless and to cry.

While at first the child takes no note of noises, he soon notes sounds and too many house noises, especially radio, disturb his sleep periods, and all jazz and loud music annoy him during his waking periods. He is made nervous by the loud and disturbing static or other rasping sounds. Outside noises, like traffic sounds, can not be prevented. Of course the more restful and quiet the region in which his sleeping room is located the better. It is by no means always advisable to have a child sleep on a veranda, unless the region is proper for this outdoor sleeping. Too much bright light tires the young child when he is awake.

It is a mistake to trundle the young child, even in a comfortable carriage, on a busy street. If he can be taken to a quiet park, that is fine, but the dust and dirt of the street and the noises cause such trundling to be inexcusable. He should not be taken for drives in automobiles too early in his career, unless it is to take him quickly to some region of fresh, clean air. He should never be taken autoing for his amusement. The swish of passing cars, the noise of the horns, and the odors of the automobile exhaust make automobile riding for him very inappropriate if not actually harmful.

When he is a little older it is not good sense to take him riding in one of the little carts, which makes him sit uncomfortably before he is ready for these muscle strains. Also, young, green "baby

pushers" are not the ones to whom the young child should be loaned. The mother should know exactly where her child is, and what other mates or children are brought to its notice and close contact, and she will know more about where the child acquires some infectious disease.

Children become fatigued very easily, and they must have absolute rest periods. As the infant becomes a child he may develop many habit affairs. He of course must not be allowed to suck his thumb or any "pacifier", or to chew clothing or anything that reaches his hands. If he has inflamed gums they should be watched and cared for, as advised by the child's physician. If he sleeps better with his "bear" or other beloved object, or she sleeps better with her doll, this desire should not be discouraged.

Brain-storms should be studied. There is sometimes a definite cause; a child is not born cussed. Unexpected vomiting turns should be investigated; they may be due to some food poisoning, or the child may have an idiosyncrasy against certain types of food. The young child who has vomiting turns may have defective eyes. The child who snores, or has frequent colds and often coughs may have abnormal tonsils, or he may have adenoids.

If a child wets the bed at an age when such a mishap should cease, it may be due to too much liquid being given just before bedtime, or because the child is not taken up toward the middle of the night; or there may be some local excuse that can be corrected. It should be recognized that a child

can not remain very many hours in bed, ordinarily, without being aroused for urination. An adult could not sleep as long as a child must without arising.

Until eight years of age the child requires about twelve hours of sleep; from eight to ten years, eleven hours; from ten to twelve years, ten hours; and from twelve to fifteen or sixteen years, nine hours. However, it must be again remembered that children are individuals, and some require more sleep than others.

The evening meal of a young child should always be light, but nutritious; the largest meal should be given in the middle of the day. Of course there can be no discussion of the fact that young children up to puberty should never have tea or coffee. They do not require that stimulation. It need hardly be suggested that young boys and girls should not be allowed to smoke even at the age of preparatory schools, to say nothing of the harm of smoking during the high school age.

If a child is afraid of the dark, it is better to allow a dimmed electric light than to have the child develop tantrums from fear. In fact, a child has fear of different things, generally, because there has been some mistake in his early training; someone has said something that has caused the fearsomeness. It is a very serious mistake to threaten a child with "the doctor," to threaten the child with "a policeman," or to give him any other threats. He should learn that the physician and the policeman are his best friends; that he should run to them at any time for comfort or protection. It is also inexcusable to tell the child

that "if he does not behave someone will come and take him away;" or for some friend to be thoughtlessly always asking the child "if he does not want to go home with her." The child immediately cringes from being removed from his mother and his home, and ever after wonders when he will be taken away. The child should never be threatened. He may be deprived of things that he desires when it is thoroughly explained to him the reason for such privation.

It is well to begin to teach a child when young to open his mouth and allow his teeth, throat and tonsils to be looked at; to teach him to allow spraying, and to show him how to do a little gargling or swashing with some simple salt solution or other liquid. He should be taught how to swallow a small pill or tablet, and in other ways he should be prepared for the possibility of the necessary treatment of some acute infection.

The child's teeth should be carefully watched and properly cared for. During any acute infection, the toothbrush that has been used should be burned, and a pledget of cotton or other substitute used to cleanse his teeth during the infection.

Every child should be allowed periods of playing by himself or with other children *unsupervised*. It is a mistake to repeatedly and constantly direct the child's play. He loses his individuality and is prevented from acquiring the ability to amuse himself, which is very unfortunate for the following years of his child-life. It is a mistake of the age that he must always take exercise in groups and must always play

games directed by some entertainer. Children should be guided, but not too much supervised.

It is needless to say that the mother is the proper one to supervise, if not actually to wait on, her child. Children's nurses are born and not made. Great judgement is required in bringing up the young child, and unless the nursemaid is mentally fitted for that sort of work the mother must not release her child entirely to her.

Parents should not keep their young children too much to themselves or too secluded, as such management tends to make the child timid, too retired, and fearsome. On the other hand, children should not be paraded before visitors, or talked about in their presence, or made to show off their accomplishments except to their near relatives, whom they have learned to know well and to like. A child will be glad to show his new toys and books, and to sing his little songs and recite or dance before these well-known and loved people, and will not think that he is on display and will not become impressed with his own importance.

A child's parents must not ignore him, or ridicule him, or constantly chide him, but must commune with him, guide and direct him, and show him his mistakes. Hardly any two children can be punished alike. The mother must learn the best method for each child.

Judicious praise and judicious rewards for honest effort and good behavior are essential in giving the child confidence and causing him to desire to do still better. He should be kindly and constructively

shown how to correct his failures. He must be carefully taught ownership, community rights, and generous sharing with others.

A young child must be taught to instantly obey, not to discuss the reason or why; later the reason for the command should be explained to him. He should not be coaxed to obey. If possible, a parent should not show his anger to a child, though he must mete out the type of punishment needed.

Parents should be very careful not to promise a child anything without keeping that promise, not even to promise a punishment that never materializes. A child must not be fretted at, and he must not often be bribed. When two or more children misbehave the parent or caretaker must use the best of judgement in ascertaining who is at fault. The one who is not at fault should never be punished or scolded. Children should always be encouraged in every way to tell the truth, even if that truth hurts. However, it must be remembered that it is a natural instinct for every animal, human or other, to conceal his wrong doings and mistakes. There is no higher art in this world than the proper management of young children. The child discloses throughout life his teaching from his parents and his school teachers.

The family physician or the child specialist should carefully study every child physically, and any abnormalities should be noted and the parents advised as to the best method of correcting them. If in any way the child's mentality seems to be abnormal, he should be very carefully studied, and many

times the condition can be improved and the child may grow to normal mental health. Very frequently the cause of mental abnormality is some disturbance of one of the important endocrine glands. There may be, in occasional instances, an inherited disease that is the cause of the mental deficiency.

A frequent mistake with older children is that they have too long school hours, do not have sufficient out-door fresh air life, and are required by their proud parents to assume too many side issues besides their actual school work, such as music, French, elocution, or even dancing lessons after school hours. Dancing is fine for children, if it does not interfere with their out-of-door sunshine life.

Over-studying is a mistake. The child must not be allowed to be too studious. On the other hand, backwardness may be due to some simple thing that can be corrected; it often is due to defective eyes.

It is a sad mistake to term a child "feeble-minded" or a "moron" unless such a determination has been made by *very careful investigations.* Some of the *intelligence tests* used to-day are not sufficient to make this determination accurate, and to dub a child a moron when such is proved later not to be the fact is one of the cruelest things that can happen to the child and his parents.

Psychiatry has become one of the medical specialties. It is supposed to analyze the mental condition of an individual and to outline the mistakes in his habits, environment, studies, occupation or labor, and to advise correction of the abnormal conditions.

Before the psychiatrist steps in, the patient should be completely examined in every line, to see if there is not some physical or physiologic defect or perhaps some pathologic condition that is causing the mental abnormality. It does not seem wise to the writer to always spend hours in investigating dreams and the early childhood life of an individual. Sometimes this investigation puts wrong ideas into the one investigated. However, if the psychiatrist can discover and advise the correction of what is abnormal in the person's life habits and surroundings, he may be greatly improved.

It would seem well for young boys and girls before preparing for or entering into some life work to discover, if possible, that work for which they are best adapted. It does not seem wise in this age to compel a boy or girl to attempt a higher education when he, or she, is better fitted for some clerical or mechanical work. Also it seems very sad for one who is adapted to higher education, and craves it, to be deprived of such education and forced to work mechanically. At the present time there is much money available to allow such children to become educated. It probably is very true that some boys and girls are receiving education from charitable money who are not fitted for and do not care for such education. Psychic analysis may straighten out these regrettable conditions.

Examinations of Pre-School Children

Every child should be examined by the family physician before he is ready to go to school. This

should be required by the schools. If the family does not have its own physician, the school physician may make the examination and then refer the child to the proper medical specialists to correct defects that are present. Infancy is now generally well supervised, but the child from two years to school age should not be deprived of periodic medical supervision. Especially should be observed endocrine disturbances, abnormal development, abnormal nutrition, bad teeth, bad tonsils, adenoids, defective eyesight, defective hearing, and, if there are evidences of anemia, the blood should be examined.

Fowler and Fletcher[1] say that more than three million school children in the United States have defects in *hearing*. This emphasizes the necessity for early examinations of children, and, while they are in school, examinations of the ears should be repeated at least once a year. If the ears are found defective and are curable, a specialist should treat the child until it is cured or no more improvement can be caused.

Defects of *eyesight* are perhaps the most common of all defects and lead to poor scholarship, disagreeableness, temper and bad behavior almost to any extent. School examinations of the eyes are only suggestive; many times defects are overlooked when the child's eye muscles correct them; all that the school can determine is that the child needs to see an oculist. Children's eyes mould rapidly, and, if there are slight uncorrected defects, school work can cause them to become gross defects. If the eyes are different, the

[1] Fowler and Fletcher, J. A.M.A., Dec. 4, 1926, p. 1877.

child may learn to obtain normal binocular vision by tipping his head. This deflection of the head may become permanent throughout life, if not early corrected.

Many children will not acknowledge that they do not see well, and may not recognize their handicap. Yet they may not be able to learn their lessons, or to see what is placed upon the blackboards. These children become disgruntled, disagreeable, refuse to try, receive low marks, are punished, and finally become very disorderly and are termed "defectives."

After proper glasses are given they must be properly worn. A child's glasses easily get out of adjustment, and then there is again trouble. The wearing of glasses by a child is deplorable, but very frequently is a necessity. The normal outlook of a child on life, and the success of his education may depend on correct glasses. Not only are frequent headaches caused by eyestrain, but frequently vomiting ("stomach attacks" the family thinks) and even sometimes fever occurs with these periodic nervous crashes. Some children lose nutrition by being unable to properly eat when they have headaches; others can not properly sleep.

Among American children eye defects are on the increase, probably because the eyes are so much more used, when the child is young, than was intended by Nature. Children are amused with too many things which require near use of the eyes. Kindergarten teaching is largely defective in this respect, and in the primary and secondary school grades too

much information is attempted to be furnished through the eyes and not enough through the ears. Maps, pictures, demonstrations, movies, etc., etc. are the vogue of the age. To meet this demand for extra eye work, extra windows have been added to schoolhouses, and at the present time the schoolroom is bordered at least on two whole sides, by nothing but windows.

When the boy or girl goes to a high school the use of the eyes is increased, and when he or she graduates and begins office or other work, the eyes again must be intensely used, and in many cases artificial light supplies the illumination. Sometimes the illumination is inferior and the eyes are more strained. Soon nervous reflexes develop in the way of stomach upsets, indigestions, nervous irritability, sleeplessness, even functional circulatory disturbances and general physical and mental tire. Even when proper glasses are used the eyes are given no rest. Movies, automobile driving, ball games, late hours, eating and dancing under too bright lights, the glare of excessive lights both inside and outside, and improper adjustment of lights for reading at home, all tend to increase eyetire, even if proper glasses are worn.

"Correct" glasses are correct only for a certain length of time. The eye-ball moulds, and the correction must be more or less frequently changed, perhaps in from one to two years, and certainly in three years, until finally the correction may become permanent. If there is astigmatism, the glasses should always be straight, and they frequently get out of adjustment; unfortunately, not all opticians

adjust glasses perfectly. Very many oculists do not consider, especially in presbyopia, the distance at which a man or woman must do most of his or her work, and bifocals are made for too near work; eye-strain is increased, and nervous irritability is caused. Many people require two sets of double lenses, one for mid-distance work and one for very near work, as reading or writing.

Reflexly eyetire can cause irregular heart action. Individuals with this condition feel sure they have heart disease and are consequently depressed, and if the cause is not found the condition gradually becomes more and more aggravated.

When there are eye symptoms that can not be corrected by proper lenses, the patient should see his physician, who should consult with the oculist as to the condition of the sight and back part of the eyes. The eye sometimes early shows organic disease.

Schools

American children are sent to school too early. This may be more or less of a necessity in cities, where the child does not have a playground and where the school is properly located and properly ventilated and has a playground associated with it. However, it is regrettable to confine a child in school until he is six years of age. The kindergarten age is perhaps from four to six. If the kindergarten lasts only two hours a day, it may be of benefit, but the child must not be allowed to do too much with his eyes. The eyes get tired and eye defects may be caused by too much of this kindergarten work. A

child, who has part of his home play in learning a few simple things of his preliminary education, need not go to school until he is six years of age, and he will advance as rapidly as though he went at five.

A young child should not be confined too much indoors. He also should be given more latitude in choosing his own types of play, as if he is too much supervised his individuality becomes lost.

For the first year two hours a day of actual mental work in school is sufficient. Gradually the hours may be somewhat increased, but the minutes of study should not be long. Three hours of actual study should not be expected until after the age of nine. The child becomes brain fatigued very easily; the young child will tire after fifteen minutes of concentration. From seven years of age upwards he can hold his attention without tire for longer periods. Not until after he is twelve years of age should as much as thirty minutes at a time of intensive brain work be allowed or expected. At most any age the child's brain, at the afternoon session is not as active. There should be frequent periods of intermission of mental work, the frequency depending upon the age of the children. Walking around, simple calisthenics, or an entire change of the instruction or some amusement should be offered the children, and immediately they are rested. A child should not be expected to study at home until at least after the age of twelve, and then he should not be expected to study more than one hour a day until he is thirteen or fourteen.

Competitive physical and even mental tests or stunts are not good for young boys and girls. In

fact they may do harm. Prolonged physical strain is inexcusable for growing school children. This does not mean that they should not play ordinary games.

It is quite a question whether secret societies should be allowed in high schools; they are certainly inexcusable in grade schools. These societies always cause more or less jealousies, sometimes ill feeling, and cause the members to go in cliques. Non-secret societies are often of advantage in high schools as teaching boys and girls the rules of parlimentary procedure and teaching them to talk before their fellows. Especially of advantage are musical and dramatic societies.

It should be emphasized that the essential studies should be pushed with school children, that the non-essential and so-called side issues and "trimmings" should be curtailed. Too much time is spent, now, in secondary teaching. The primary groundwork is at the present time insufficient.

When it is discovered that a child is not making mental progress, or misbehaves, he should be thoroughly studied by the medical inspector or examiner to note whether or not there is a physical cause for his failure to progress normally. If there is such a cause its correction will very generally allow the child to become normal mentally. If it is decided that the child is feeble-minded and can not progress with his class, he should be segregated in a school that is especially for feeble-minded children whose progress is slower, and he will not feel the chagrin of not being able to keep up with his fellows.

So-called intelligence tests do not necessarily prop-

erly identify the able mental child and the less active brain of another child. A child is not necessarily a moron because he does not answer accurately or quickly these intelligence test questions. Very serious harm is done if a child is placed unnecessarily in a subnormal class, a class that progresses slowly. He loses the stimulation of keeping up with his brighter fellows, and immediately drops to the mental ability of those in the subnormal class. In other words, the greatest possible care, not by young teachers or young "testers" but by skilled, older, well-balanced mental examiners, must be exerted to decide exactly to which class a child belongs.

Children who are found to be extra nervous or who apparently have brain-storms or crying times, or show stage-fright, stammering, etc., should be studied medically, and then be placed in such classes as seem best to improve the condition and prevent these acute attacks that are harmful for the child.

The morbidly precocious child, who always desires to over-study and shuns playtimes and association with other children, should be carefully watched and compelled to stop his extra book work and to take more physical exercise in the open air. Such a child should have proper treatment early, else he will stand high but amount to nothing in the future. Neither a very brilliant precocious child nor a "bookworm" are successes in this world.

School Hygiene

Investigations have shown that in most cities there are a large number of children who are under-fed

and under-nourished. This seems not to be the fact in most country districts, perhaps because more milk, eggs and nutritious vegetables are available at a smaller cost in the country.

It has been found by some investigations that a small percentage of children come to school without breakfast and a large number with insufficient breakfast. The cause of this may be poverty, or lack of appetite from unhygienic sleeping quarters (insufficient fresh air and crowding), or, in well-to-do families, the child rises late, is in a hurry for school, and is unwilling to take time to eat. Many city schools have inaugurated the custom of giving these children luncheons.

Medical school inspection, which is almost universal in cities, and, also, is carried out where possible in country schools, doubtless reduces the percentage of contagious diseases by not far from seventy-five per cent. The primary inspection is to determine physical and mental defects, while repeated inspections are made to early decide whether or not a child is becoming ill. The most frequent cause of illness in school children is some form of a cold, and the absence from school on account of illness is, in forty per cent. of the cases, due to some disturbance of the lungs or upper air passages.

By far the most frequent so-called "children's disease" is measles, and it has been estimated that by the time adult age is reached probably at least eighty-five per cent. of people in civilized communities have had measles, not far from seventy per cent. have had whooping cough, about sixty-five per cent.

have had mumps, about fifty per cent. have had chicken-pox, about twelve per cent. have had scarlet fever, and a small percentage have had diphtheria.[2] With the present methods of inoculation to prevent diphtheria, this disease will continue to decrease in frequency. It is also probable that scarlet fever prevention will cause a diminished frequency of that disease. It is not necessary to close schools to prevent the spread of a contagious disease, if the town has a board of health and the schools have medical supervision.

The benefit of medical physical examination of school children is so great that it can hardly be measured in figures. Probably not far from seventy-five per cent. of young school children have defects of some kind that can be ameliorated, if not cured.

The most frequent defect of young school children, perhaps fifty per cent., is some type of abnormal teeth. Some teeth should be extracted; some filled; some are interfering with the eruption of the second and permanent set of teeth; and some children have deformed mouths.

The next most frequent abnormalities are diseased tonsils and adenoids; next is abnormal vision; next abnormal ears; and next, perhaps, are heart defects. Very many have some signs of tuberculosis, but at the present time this disease is generally discovered before the child reaches school, whether it is the bones, the glands, or, more rarely in children, the lungs that are affected. A very large number have some spinal curvature.

[2] Collins, S. D.; Pub. Health Reports, 39, June 27, 1924, p. 1553: Editorial, J.A.M.A., Nov. 29, 1924, p. 1771.

Not as many as formerly, but still a large number are found to be under-fed or wrongly fed. At the present time, however, there is too much routine in feeding children in school. The well-fed and the overweight should not be encouraged to have milk during the school session. These children should be given fruit. There is altogether too much decision as to overweight and underweight based on age, height and weight; not enough consideration is taken of the inherited characteristics of the child's family. We can not judge children as we would Ford cars. Children are individuals not only in their mental attributes and physiognomy, but also in their relation of height to weight.

Calisthenic exercises and teaching of correct breathing, correct standing and correct walking and especially correct sitting at a desk are essential in the supervision of children at school. The child's desk and chair should be correlated with his sitting height, else he will develop round shoulders or other deformities.

Each pupil should have fifteen square feet of floor space and 200 cubic feet of air space. Each schoolroom should be about 30 feet long, 25 feet wide, and 13 feet high, and should accommodate not more then fifty children. The temperature should be 66° to 68° and not more than 70°F., and the humidity between 30 and 60. A thermometer should hang in the room where it will tell the truth.

It is hardly necessary to discuss in this sanitary age the fact that there should be first class toilets, drinking facilities that can not cause contamination

from an ill pupil to a well one, and paper towels. Pencils and books should not be exchanged unless they have been sterilized. Putting pencils into the mouth should be strictly forbidden. Moistening the fingers with the tongue before turning the leaves of books should be prohibited. Daily cleaning of each room with a vacuum cleaner is necessary, and at least once a week antiseptic cleaning of schoolrooms should be carried out. The best method for this will be dictated by each Board of Health.

Fire drills are of course now carried out in all schools, and a school can not be now built without safe fire escapes; and of course school doors should open outwards.

At the present time all new schools have sufficient light; it is a question if some schoolrooms do not have too much light. This is the age of too many blackboard demonstrations, too many maps and diagrams, too many pictures in textbooks, too many moving pictures. Children go too frequently to moving pictures for entertainment. It gives them wrong ideas and is harmful to them, and it is a question whether it is of advantage to add to their eyetire moving pictures in teaching, except in rare instances. All of these things cause over-tire of children's eyes. They are not taught how to acquire knowledge through their ears or even by study without diagrams and pictures. Some of these methods of teaching are essential, but the age is over-using its eyes, and the increase in the number of children who must wear glasses is very great. The child's eyes are never at rest. There is dancing, automobiling at night, bright lights, glimmering electric advertising displays, etc.,

etc., until the child's eyes become weary and finally defective, even if the child is not born with defective eyes. The adult's eyes also suffer from some of the causes enumerated.

Feeble-Minded and Backward Children

The definition of a "feeble-minded" person has been decided to be one who is capable of earning a living but from birth is unable to compete mentally with his normal fellows, and who has a diminished ability to care for himself and his affairs. An "imbecile" is one who is defective from birth and is incapable of earning his own living, but may guard himself against physical dangers. An "idiot" is a person who is absolutely defective from birth and is not even able to guard himself against physical dangers. The least defective, the feeble-minded, are termed "morons." Each class, morons, imbeciles and idiots, have been subdivided into three grades, high, middle and low. The majority of mental defects are congenital, although the cause of such a condition may occur at or after birth.

While feeble-mindedness in its various forms is frequently due to heredity, it is not always due to that cause, but parental alcoholism has certainly been proved to be a factor. Other conditions that predispose to the birth of mentally defective children are feeble-mindedness in the parents, syphilis, tuberculosis and cancer. Syphilis especially predisposes to feeble-mindedness in the children.

Diseases and injuries of the mother during gestation predispose to the birth of a defective child.

Also great exhaustion, overwork and abnormal endocrine glands predispose to the birth of defective children. Long and difficult labor and instrumental delivery may produce a feeble-minded child. Cerebral hemorrhage, meningitis and serious infectious diseases may cause the young child to become defective; especially is epilepsy a cause. A hemorrhage into the child's brain or birth asphyxia may be causes of feeble-mindedness.

There is no doubt that insufficiency of the endocrine glands is a very prominent factor in the cause of feeble-mindedness of all grades. The glands most involved are the thyroid, thymus and pituitary. Absence of thyroid secretion produces a *cretin* idiot. All grades of insufficient secretion of the thyroid gland cause all grades of feeble-mindedness. Absence of thymus secretion produces a *Mongoloid* idiot, and all grades of disturbances of this gland cause many types of abnormalities. Pituitary gland abnormalities cause deposits of fat, prolonged infantile type of growth and feeble-mindedness, or the reverse, precocity and over-growth.

While the diagnosis of feeble-mindedness may be easy in older children, it may at times be very difficult in the very young; but suggestive associated symptoms are the slow development of muscle control, delayed speech and delayed walking, provided that rickets is not the cause.

McCready[3] says it is a fact that in ninety-one per cent. of individuals the left side of the brain has control of the more complicated motor functions per-

[3] McCready, E. B.: International Clinics, Vol. III, Series 32.

formed by the right side of the body, while the right hemisphere attends more especially to the nutritive functions through the sympathetic nervous system. It seems that each individual is congenitally either right or left sided, and McCready thinks that those children who use the left hand by preference should be allowed to continue to do so until after the development of language in all its manifestations, including writing, and not until that time to force the use of the right hand. He thinks stuttering is a congenital defect.

McCready believes the feeble-minded child has a right to the fullest education that he can accept, and especially is industrial training, public or private, necessary.

It has long been shown that feeble-minded children or youth comprise a large percentage of our criminals.

It should also be remembered that in our economic life morons have their place in doing the monotonous things that must be done in our civilization.

Chapter IX

Some Statistical Facts

In almost all countries more boys are born than girls, probably Nature's method of keeping the sexes about equal, as the mortality of male infants is greater than that of female infants.

Fitz[1] has investigated the young girl, and finds that her most striking characteristic is her weight. She tends deliberately to under-nourish herself in order to keep thin. He found comparatively few underweight young men, but girls are almost universally underweight.

The modern girl wears too light clothing. On weighing the clothing of a group of girls he discovered that two pounds, including shoes, was considered an excessive amount to wear, while an ordinary evening costume weighs about twelve ounces. One result of such light clothing is that she is constantly cold. Her temperature is subnormal most of the time, and she readily develops symptoms of under-nourishment. She is constantly below par, and has colds; is easily tired and frequently has minor infections. She soon begins to take more tea and coffee than is good for her in order to brace, and then smokes cigarettes. She frequently takes aspirin, phenacetin or pyramidon for headache or pain, and often luminal or veronal for sleep. She later finds she likes two cocktails better than one, and three better than two; it peps her up, and the vicious cycle goes on.

[1] Fitz, Reginald, Boston; Hygeia, June, 1928, p. 303.

Emerson[2] discussing health habits in a woman's college, finds that faulty habits, which he has tabulated in the four years of college life, increase in the senior year. For instance, the bad habits as a whole are 11 per cent. in the freshmen and 23 per cent. in the seniors; fretfulness 34 per cent. in freshmen and 49 per cent. in seniors; irregular bedtime 36 per cent. in freshmen and 47 per cent. in seniors; over-doing at work or play 15 per cent. in freshmen increased to 21 per cent. in seniors; inadequate vacations or weekly rest 31 per cent. in freshmen and 50 per cent. in seniors; finicky about food 15 per cent. in freshmen and 23 per cent. in seniors; candy or sweets between meals 55 per cent. in freshmen increased to 65 per cent. in seniors; insufficient exercise or outdoor sunlight 25 per cent. in freshmen and 63 per cent. in seniors. Excessive use of tea, coffee and tobacco is greatest in the junior year, 9 per cent.

He says there is no regular program for rest or quietude while the college is in session or during vacations to reduce the strain of modern living and let the body and mind recuperate.

Nearly 40 per cent. more seniors than freshmen are "indoor minded." Sixteen per cent. more seniors than freshmen fall below the average weight for height; and 15 per cent. more seniors were in the danger weight zone, which runs 7 per cent. or more below the average. While college girls lost 16 per cent. of physical fitness, college boys gained 6 per cent. He says that "the greater the student's theoretical knowledge of health, the poorer his

[2] Emerson, W. R. P., Boston; J.A.M.A., May 14, 1928, p. 1334.

practice." "Although health education is rated as of first importance in our educational system, study of its application may well raise the question whether it is not at present the very last in efficiency."

Bradshaw[3] says it has been found in studying disease in students that self-supporting students have more ailments than those who are not earning their living and their own tuition. Also that more students who are self-supporting must enter hospitals or infirmaries than those who are independent. Women students have very many more ailments and hospital days than men students, and self-supporting women have many more ailments than independent women.

Employment of Females.—In 1920 the United States Census showed there were 8,549,571 women employed in wage earning occupations.

Dunlop[4] divides these employed women into: (1) Young immature girls who have early functional disturbances. (2) Mature young women who are experienced and educated, and take their work seriously. (3) Young married women who have no children and want to help earn some money. They generally do both housework and outside work. (4) Widows, with or without children, a little farther advanced in life, who must go to work, and are trying to run a house at the same time.

The girls of the first class frequently have menstrual disturbances, keep late hours, dance, have short sleep periods, and are likely, with these late evening

[3] Bradshaw, R. W.; J. A.M.A., June 2, 1928, p. 1775.

[4] Dunlop, E., Internat. Journ. Med. and Surg., July, 1928, p. 366.

affairs, to have all sorts of sexual engorgements, with resulting nervous disturbances. The second class is physically the best, but many of these women of both first and second classes develop hysteria, and easily develop occupational neuroses. Some of these women, especially in the first and third classes, acquire gonorrheal infection, with resulting pelvic disturbances. The fourth class often have pelvic disturbances from child bearing, and are really unfitted for industrial occupations. Sickness in women in occupational work is about twice as frequent as illness in men. Careful study of the disabilities of these women, frequent examinations to forestall disease, and the necessary treatment very greatly reduce the sickness rate. The thyroid gland often becomes abnormal in these women.

Fatigue is a prominent factor in causing accidents, and also in causing mental and physical breakdown. Many occupations are a hardship for women who must work during the menopause period.

Dunlop condemns the practice of going without one's breakfast, and wearing abnormal shoes. He also cautions against the harm done by holding the urine too long. Every group of female workers should have very accessible and clean toilet facilities. Constipation should be avoided as very harmful to these women.

Chapter X

Physical Exercise

Physical exercise in some form is necessary for every individual. The busy housewife and mother does not need it, as she gets enough. The same is true of a man who labors hard. Those whose occupation requires them to stand, to frequently go up and down stairs, or to walk a great deal also do not require much more exercise. All who sit at their occupation should train their muscles, and especially take breathing exercises. They may do their "daily dozen," provided there is no physical reason why such exercises should not be carried out and the exercises are not too severe. Many men and some women do altogether too strenuous stunts. Any exercise that tends to cause exhaustion, nausea or loss of appetite is too severe. Too prolonged exercise is inadvisable. Too severe plays are foolish, especially for a person over forty years of age.

Strenuous plays, games or athletic stunts should not be allowed young children and growing youth. All children, unless there is some physical reason why they ought not, should be taught to swim. Young children should be allowed to direct their own games, but class exercises for older children and youth are very healthful and cause symmetrical development.

During the last twenty-five years there has been a gradual and continuous increase in athletic strenuosity. Athletics have assumed the same speed as has every other human occupation and pleasure. There

is no rest. A man rushes from his work to his golf course, and plays thirty-six holes instead of nine or eighteen; or the younger man plays many sets of tennis, all with a rush and without regard to his physical tire. If he is a hiker, he thinks he must climb hills at speed, even if his business requires him to walk many miles a day. Everything he does is a stunt. This is especially true of the younger generation. The women also attempt the same excessive amount of exercise. Even when one motors he must go at speed and great distances, and driving to-day is a continuous tension, even high tension, on most of the thoroughfares. Instead of motoring to some restful spot and there calmly enjoying it, he sees how far he can motor and how quickly he can return and then talks about the ground he has covered and the speed, and the miles his car goes on a gallon of gas.

Many physical exercises are taken only spasmodically, that is, at week-ends. This is not the way to train muscles and especially heart muscles. Few know how to train; they start each week-end with a spurt of excessive play, and then are tired the rest of the week. Men over seventy compete at golf with men of thirty and forty; there is danger in such competition.

With all the many equipments for speed, such as telephones, stenographers and dictaphones, and with ceaseless interviews, hurried eating and often overeating, the business man does not know how to slow down. He is also likely to have many business or civic conferences, hustles to do committee work,

hastens to board meetings, and often smokes excessively or drinks too much coffee to ease his brain and muscle fatigue. If he is harboring some chronic mouth infection, which most adults after thirty-five have secreted under their wonderful (?) dental improvements, this adds to the handicap of his already tired heart and circulation. Heart disease, high blood pressure and kidney disease are on the increase, due to strenuosity and chronic infection.

Haggard[1] has found that the left side of the heart, the side that pumps the blood all over the body, does, when the body is at rest, a minimum amount of daily work equal to lifting the person upward more than 500 feet. He also has estimated that during exercise the volume of blood pumped may be three or more times as great as when the body is at rest and the blood pressure may rise 50 per cent. or more. The work of the heart thus may be increased fivefold.

Benedict and Parmenter[2] find by tests that the average person expends as much energy in walking up an ordinary flight of fifteen steps as he does in walking on a level fifteen times the distance represented by the height of the staircase, which in ordinary houses is about ten feet.

Women do not escape the strenuosity of this era. They frequently drink too much tea, smoke, and add athletic sports to their household tires. They also have too many social engagements. The result is the same as with the men, except that they have

[1] Haggard, H. W.; Science of Health and Disease, 1927, Harper & Bro., New York.

[2] Benedict and Parmenter; Amer. Jo. Physiol., April, 1928, p. 675.

more nervous irritability due to over-stimulation of the thyroid gland, which is always very active in normal females.

Besides these conditions, the constant inhaling of automobile exhaust, which contains more or less carbon oxide and other products of imperfect gasoline and oil combustion, may cause serious poisoning of the blood. One may also inhale the exhaust from the combustion of gasoline that contains lead, at most any time while motoring in traffic. All of these substances injure the blood, cause headache, and irritation of the mucous membrane of the nose, throat and larynx.

There is a craze at the present time for *competitive athletics*. The craze is not now confined to colleges and universities, but high schools and even grade schools have their athletic associations with competition for making the different teams. Unless there is a medical examination of such boys and youth, it can not be determined whether they are fitted for strenuous athletics. A certain number are not, and consequently these are harmed by unsupervised and not graded athletic tests and contests. Especially is it harmful in later high school and early university years for an over-grown, heavy-weight boy, whose heart has not yet developed to the bulk of his body, to take part in athletic drills and competitive finals. His heart and circulation are not equal to his bulk, and the heart becomes easily strained. The circulation of a young boy in grammar school or high school may have been damaged by some serious illness; exercise in such cases should be under medical

supervision and should be graded, whether this training is for running, jumping, football, basketball, swimming, tennis or vaulting.

Young girls in schools and seminaries are now taking part in strenuous athletics. They have their ball and basketball teams, are even playing football and are vaulting. These young girls are developing into young women, and they are not physiologically or anatomically constructed to take part in hard athletic work. They may be permanently injured, and may suffer in consequence for the rest of their lives. Nothing in the above discussion is intended to disapprove of graded calisthenics, ordinary non-competitive athletics, and out-door exercise for all children and youth.

Out-door exercise and sports are essential for the health of the adult. However, adults have forgotten that ordinary walking is fine exercise; they use an automobile for even a short distance, and they then state at the end of the week that they must have more exercise and do some foolish athletic stunts. Hard physical labor after the age of forty-five, especially for one who has not done much physical work, is dangerous and likely to shorten life.

Physical defects in young boys and girls should be discovered early in their school life, and such defects should be eradicated, if possible. Defects in muscles, bones and joints; fallen foot arches; crooked spines; the defect of one hip being higher than the other or one shoulder being lower than the other; poor posture in standing; and bad methods of walking should all be studied and exercises advised and ordered for

correction of these defects during the period of rapid growth. Normal equilibrium and symmetry determine good posture, both standing and sitting. Round shoulders and various deformities of the spine, shoulders, hips and abdomen may develop from incorrect posture, and bad posture occurs from diseased conditions of the bones or other parts of the body. Such bodily defects are now ascertained and studied in all colleges and universities, and it is astonishing how large a number of students have one or more of these defects. When these abnormalities are properly managed by correcting exercises early in the college career, many will graduate with their defects cured.

If not before, certainly early in the school life of a child defects in walking, standing, sitting at desks, round shoulders, stooping, and the habit of cocking the head to one side or the other, should all be noticed and treated. The majority of these deformities and habits can be corrected and need not persist in after life. Bad tonsils and adenoids, which inhibit the normal growth of the nose and face, should be early recognized and eradicated. A child who tips his head to one side frequently has an eye defect, the eyes not being alike. If this defect is recognized and corrected the child will not carry his head crooked for the rest of his life.

Many children and many youth do not know how to breathe. They should be taught how to expand their lungs, and if they have protuberant abdomens this condition will be improved. Defects in standing and sitting may cause this type of deformity.

Proper exercise should increase the breathing, produce a mild perspiration, cause a more healthy skin activity and make the muscles normally grow. At the termination of sturdy exercise there should be such bathing as is deemed advisable, and in certain conditions, where muscles are defective, massage should be done. There should be a feeling of glow and health, and, if it is time to eat, there should be a good appetite after exercise. If the person has exercised to exhaustion he may have palpitation of the heart, may be nauseated and may actually vomit. He may also have a headache and low blood pressure, and the urine may show signs of too severe labor.

In this place it should be urged that growing boys, and most certainly young girls, should under no circumstances smoke. Tobacco should not be allowed to inhibit normal growth and health. It especially prevents the development of the chest, and therefore the health of the heart. Cigarette smoking is the type which is in vogue among the youth of both sexes. It is regrettable that bad examples are set these young people by teachers, instructors, and even nurses, to say nothing of the older members of the family. Some colleges for girls not only do not prohibit the smoking of cigarettes, but are even providing smoking saloons for them. Very elevating, is it not, to vision a group of young girls sitting or lying at ease in a university lounging room with the air clouded and befouled by tobacco smoke! It is not a question of how many cigarettes can be smoked without harm. It is a fact that a large number of young boys and girls, who acquire the habit, smoke

excessively for their age. Tobacco interferes with the muscle growth, interferes with appetite, and interferes with nutrition, and the cigarette-smoking boy or girl does not properly grow mentally or physically.

It is recognized by all trainers for competitive athletics that no one in the training squad should smoke during training or during the competitive tests.

Gymnasiums are very valuable acquisitions for every school of any size. Playgrounds are necessary, and play parks should be established in all cities. Country children do not need such special spaces for their play.

Young growing children should be especially watched that they do not wear shoes that are too short, or shoes, handed down from an older child, that are too long. Also it should be noted whether the heels have become worn so that the tread is abnormal.

Riding on a bicycle is not very good developing exercise. The position of the child or adult is abnormal; he does not use all of his muscles well, but only uses certain of them. The pelvic bones may become deformed, especially in girls. Leaning over the handlebars does not allow good breathing, and the child or youth may strain his heart by pedaling the bicycle up a hill.

Hiking, playing ball and tennis, swimming, bowling, directed exercises in classes, and various gymnasium exercises, short running or trotting, etc., are all good physical work for girls, boys and youth. For older boys and girls horseback riding, when it can

be had, is splendid exercise. Rowing and sculling are good exercises. Dancing, not to exhaustion, not in the mode that is so objectionable to-day, and to music that is pleasing and not an insult to one's ears, is another fine exercise.

The strenuosity caused by the more severe competitive athletics, entered into by universities, severely harm the participants. Running against time and competitively may do harm. Football is one of the roughest of games, and the hazards are so many that thousands of Americans travel hundreds of miles to see such a scrap. Competitive rowing may do serious harm to the heart, and some hearts may never recover their former strength and normality. A two-mile boat race, or at the outside a three-mile race, is long enough for any varsity competition, and for the under classmen two miles should be the limit.

Marathons.—This is the age of marathons, that is, tests of strength and endurance for no real reason except for personal notoriety and for gallery approval. We have grown crazy over competitive tests. It is high time to come down to earth and common sense, so-called "horse sense," if that sensible commodity has not been permanently lost.

One of the most ridiculous of these marathons is dancing to exhaustion. The disease that causes this public test of male and female endurance is "dancitis," and those who suffer from it should be confined in some sanatorium until they become normal and harmless to themselves and will dislike to hug some one of the opposite sex publicly for twenty-four hours

or more at a time. Those afflicted with this peculiar disease may even sleep publicly in each others arms, while their feet move automatically like mechanical toys.

Dancitis is only one of the many modern acute diseases. We have "swimitis," one form of which is "channelitis," in which the greased sufferer from the disease swims for hours and is fed by some nourishment poked into his or her mouth. They learn to chew and swallow while swimming. This disease is not very prevalent, but it is very acute when it attacks one. The best treatment of this disease is to totally ignore it; it then tends to cure itself.

"Golfitis" is very common among older men. The symptoms are a desire for daylight saving time, and, after a more or less sedentary period, a desire to go to the golf links, and, instead of being satisfied with the splendid exercise of playing nine holes, those afflicted must play eighteen, or even as many as thirty-six holes, arriving back at the clubhouse tired and exhausted. After showering they are too tired to enjoy the evening meal, and are generally altogether too late for the home dinner. A prominent symptom of this disease is for a man to forget and almost ignore his family and its need for his companionship. This disease often ends in serious heart weakness, due to overwork. Men over fifty should take their plays in small, sensible doses.

Some people play tennis who are not physically fitted for this jumping game. Others play it too long at a time.

A serious disease, serious for the individual and

for his relatives, is the craving for aviation stunts, especially Atlantic stunts. The world holds its breath and the governments, especially the United States, spend money to find what can be salvaged.

Some personal insanities occasionally develop but are soon over, and the public does not long suffer; such as jumping off the Brooklyn Bridge, shooting Niagara Falls in barrels and balls, climbing up the face of tall buildings, etc.

A recent stunt is one that afflicts our most comely girls, and has its beginning in the daily papers and the theaters. This is not a real disease, but is only an aggravation of a feminine attribute which in moderation is not abnormal, namely, for girls to exploit their bodily and mental charms. These are the so-called 'beauty" and "personality" contests. The sellers of female apparel take part in promoting these publicity stunts. The harm of this public demonstration of the feminine figure is that it makes the girls who participate blasé and causes them to lose their modesty (almost a lost attribute). As a consequence the public becomes more or less disgusted with girls as a class. However, these exhibitions furnish great pleasure to the judges, who are always old males.

Another very common disease is "autoitis," a terrible disease, which is generally associated with "speeditis" and not infrequently with "alcoholitis." These three diseases make a very dangerous combination for those afflicted, for their companions, and for the riding and walking public. The consequent toll of life is tremendous. There is no discovered

cure for autoitis, except to arrest the automobiles that are playing an innocent part in this contagious disease.

Bicycle riding for days, for a record, is another popular marathon. Is there any real pleasure in watching a man or a woman become exhausted in a speed or endurance contest? The audience goes home and forgets the strained face of the bicycle rider or the runner of a foot race, and never learns whether or not that strained heart caused any future disability, which it often does.

Another personal marathon is the "daily dozen" stunt. Many men and women do altogether too severe morning exercises without regard to their physical condition. They are the vogue and are stunts, and may even be done in unseen classes by radio direction. These same persons will not walk two blocks; they use automobiles and trolleys.

Let us try to promote exercises and athletics normally, not abnormally.

Rest-Cure.—This is a term applied to long rest in bed, with extra meals, and then graded exercises. This "cure" is well carried out only at a sanatorium, as it should also include rest from one's own family and personal friends; in other words, a mental as well as a physical rest. This particular type of treatment is often called the "Weir Mitchell treatment," it having been instituted by him about forty years ago.

Doctor S. Weir Mitchell was a very noted physician and author, who lived in Philadelphia and died not many years ago at an advanced age. He insti-

tuted this treatment at a time when so-called nervous prostration or exhaustion, later termed "neurasthenia," began to be of frequent occurrence, due to the beginning speed of our civilized life. Rest periods had previously long been ordered by physicians, but the necessity for a separate diagnosis for mental and physical tire, without any serious disease being present, began to be evident about fifty years ago. This "tired" condition has rapidly increased in frequency due to the strenuous life of to-day. This type of exhaustion is caused not as much by a normal amount of physical labor as by mental tire, and occurs most frequently in women, due to their interminable number of social engagements. Nervous tire, to-day, is due to the speed of our lives, whether in duties, engagements or in play. It is aggravated by the excessive cigarette smoking which is so much in vogue; by the amount of coffee and tea that is drunk; by late hours; and by many other nerve irritants of this restless age. A normal amount of sleep, with days and periods of rest from business and social engagements, without false stimulation from coffee and tea or from the over-use of tobacco prevents the development of this neurasthenic condition.

Neurasthenia is not a very good term, and is being avoided by physicians, as very frequently careful examination of one apparently suffering from this condition or of one who is termed "neurotic" will show some definite cause. Some chronic infection, especially in the mouth, is often an associated cause of "nervous breakdown," as it is so frequently

termed. Even as simple a thing as eyestrain may cause physical and mental disability, until correcting glasses are used or the eye-tiring occupation is changed.

Carelessness by someone in not properly analyzing the condition in a given case may cause the patient to be relegated, ultimately, to an insane asylum, because he has become, apparently, mentally unsound. Such treatment is absolutely wrong and inexcusable in very many cases. At the present time psychopathic wards have been established in many hospitals, and also many sanatoria are available, where nervously tired patients may be treated.

Before a given patient is put into a psychopathic ward, very careful physical examination should be made to determine whether there is not some definite underlying cause for the brain tire. Very many of these patients do not show any mental aberration, the only symptoms being sleeplessness and nervous irritability plus physical weariness. A rest-cure under proper medical supervision, with a monotonous routine of the administration of nutriment, of taking a graded amount of exercise, from sitting up to walking, with graded mental entertainment, will generally restore these patients to health. If, however, they return to the same excitable, restless life (unless some physical cause for the condition has been found and removed), and if there is in the home continued mental irritation, frets, worries and sorrows, they are likely to have relapses.

Improper foods and unbalanced diet is often a cause for this kind of disability. Again it should be

emphasized that eyestrain must be removed, if present, and that every focal infection must be eliminated, if possible. Anemia is often present and must be treated.

Change of environment is always beneficial. If one has the financial ability to travel, it will almost always cause a cure, provided the person does not carry the cause away with him in his own body.

In many cases a modified rest-cure may be carried out at the patient's home by increasing the number of hours of bed rest and quiet, with such changes in the diet and such medicinal treatment as seem advisable. Sleep is essential. Massage is often of value.

Ever since there were medical men the mind has always been stimulated by the physician; patients have always been encouraged. Some physicians have that innate ability to soothe and encourage their patients, while others, unfortunately, may not have that attribute as positively in evidence; the Christian Scientist has not discovered a new therapy. There have always been mental cures and always will be mental cures. Cheerfulness is essential to help these patients to recover.

The word "hysteria" has been very much overused, and at the present time the condition is not of very frequent occurrence. It simply means an unbalanced mental condition; the hysterical patient does not enjoy her assumed disturbances. Some mistake in her nerve reactions cause her to exaggerate an abnormal condition that is generally actually present. A careful physical and mental examination and wise treatment will generally cure these patients.

Some endocrine gland disturbance is usually present, and, as the condition of hysteria is more frequent in women than in men, there will generally be found some abnormal female function.

It can not be too frequently urged that, if any person develops symptoms of mental tire, it is not at all necessary to term it beginning insanity, or to consider sending an abnormal mental patient to an insane asylum. The patient should first be studied in some psychopathic ward. It should be recognized that brain tire can occur as well as may other parts of the body become tired. A symptom of brain tire is some abnormal action or some delusion, which may become cured by removal of some focal infection, or by assisting the normal physiology and giving sufficient rest.

Chapter XI
Infection

Infection means that some pathogenic (disease-producing) germ has invaded or gained foothold in the individual. The germ or bacterium may be one of many, the most important of which are the pus-forming germs; the germs that injure the blood and the blood-producing organs; the germs that cause pneumonia; the germ of tuberculosis; the germ that causes syphilis; and the germs that cause serious infections, as well as those that cause milder chronic infections. The germs termed *streptococci* occur in many types, some of which are very malignant. These germs cause varying symptoms, depending upon their types and the part of the body that is attacked. They may attack the head and cause fatal meningitis. They may attack the appendix, and a fatal result is prevented only by operation. The tubercle bacillus, as is well known, may attack various parts of the body and cause varying symptoms, depending upon the part affected.

Local protective processes may hold the infective germs at one part, as in a finger, in a tooth, in a tonsil, in the appendix or elsewhere. This reaction is termed inflammation, and consists of heat and redness (increased circulation), swelling (due to the concentration of white blood corpuscles of the blood whose aim it is to surround the germs of infection and wall them off from the rest of the body), and pain, more or less (depending upon the amount of swelling

and the tension of the part affected and the localization of the nerves).

The duty of the white blood cells, in gathering at the point of invasion of the germs of disease, is to destroy (eat, swallow) the offending bacteria, or if unable to do this, to surround them by an impregnable wall through which they cannot pass. Many white corpuscles perish in this warfare, often with the formation of pus as a consequence of their defeat.

When germs of infection have attacked some external part of the body, immediate cleansing and the application of some antiseptic may kill the germs and prevent their infecting the body. If the infection has gained a firmer foothold, incision of the part and treatment with antiseptics may prevent the spread of the infection. The localized swollen area should never be rubbed, bruised or massaged, as such treatment will interfere with Nature's attempt to localize the disease and prevent its advance into other tissues. Generally pus, as soon as it has been diagnosed, should be evacuated, and such dressings used as will prevent its damming back in the tissues and causing absorption and general poisoning.

The spread of a localized infection generally takes place by means of the lymphatic vessels and is noted by tenderness along these vessels and by swelling of the nearest lymphatic glands. These lymphatic glands have been well likened to outposts, or small fortresses, that enlarge and by their contained cells prevent, or attempt to prevent, the

farther invasion of the infecting germs. If the nearest lymphatic glands are unable to combat the infection, the next group of glands become involved, and if the region of the primary infection is not immediately and properly treated, general blood poisoning will occur, the first symptom of which is fever.

If the acute infection passes without serious symptoms, but the neighboring lymphatic glands remain swollen, showing that they are still harboring bacteria, or if some slow-going chronic infection occurs in some part of the body, as the tonsil, or at the root of a tooth, the condition has become one of *chronic local infection*, and the individual has developed more or less temporary immunity, which means that he has walled off the infection and has become immune to the toxins that are produced by these germs.

The danger of a chronic local infection is due to the toxins produced by these germs (live germs eat and excrete), which are absorbed into the blood and cause slow poisoning of one or more parts of the body and often do more or less incurable harm. These toxins may attack the nerves, causing neuritis; the joints, causing arthritis (rheumatism); important internal secreting glands (termed endocrine glands) as the thyroid (goiter gland); the heart, kidneys, pancreas, liver, etc. Some germs may cause acute inflammation distant from the point of local (chronic, focal) infection, such as appendicitis, ulcer of the stomach or intestine, abscess of the kidney, etc.

Immunity to the germ of a localized chronic infection means that the individual has acquired a

tolerance for the poison that the germ produces. This immunity, however, is only partial and lasts only while the person is perfectly well and not fighting other germs of disease. Anything that breaks down the individual's resistance, as some acute infection like influenza, pneumonia, or typhoid fever, or the shock from an injury or an operation, will so diminish his immunity against a chronic infection that the germs of that infection may begin to cause serious symptoms, which may terminate in death. Therefore, every focal (local) infection, though chronic and inactive, is a menace to the individual who has it. It is like a piece of dynamite ready to explode by the action of the right kind of stimulus.

DISINFECTION.—A *disinfectant* is something that will kill germs. An *antiseptic* may prevent germs from growing and still not kill them. The term *fumigation* is generally used to mean killing of germs in buildings, rooms, closets, beds and clothing. Such fumigation is also often termed disinfection. The disinfectant used should kill all living creatures, parasites and bacteria, from rats to germs.

In every case of contagious disease there should be daily disinfection of the excretions that carry the contagion and of the utensils used in feeding the patient, and of all clothing and bed-clothes, when removed from the patient. If this disinfection is efficient and the nurse takes the proper care of her own disinfection, the contagion will not be spread. The attending physician and the city or state Board of Health will give the necessary instruction for the

care of each type of contagious disease in order to prevent the infection of others.

It has been found that very few infectious diseases are carried by the air from one person to another; the contact is very much closer. In other words, some infected secretion or excretion (most frequently from the nose, mouth and throat) directly reaches the second person who becomes infected. The contact may be from eating utensils, from handkerchiefs, from breathing atmosphere into which the sick person has coughed or sneezed, or from some article of clothing, or furniture, or anything else that has been contaminated and is then handled by the innocent individual. This method of infecting others occurs with diphtheria, tonsillitis, scarlet fever, measles, German measels, whooping cough, mumps, various types of colds, pneumonia, tuberculosis, cerebrospinal meningitis, infantile paralysis, and many of the pus infections.

Typhoid fever, dysentery, cholera and other bowel infections are mostly acquired by eating or drinking infected foods and liquids. The venereal diseases are acquired by more or less close contact. Some diseases are transmitted by the bites of infected insects, such as lice, fleas and mosquitoes. Infected mosquitoes transmit the malarial fevers and yellow fever. Typhus fever is transmitted by infected lice; bubonic plague by infected fleas; smallpox by more or less close contact with a person who has the disease. A recently discovered infectious disease is termed tularemia. It is acquired by handling infected wild rabbits, squirrels and sheep. Those who

handle the skin and fur of these diseased animals may become infected. Also the bites of infected ticks and, probably, fleas may cause the disease.

A *carrier* is one who has had a transmitable disease and has been apparently cured, but still the germ of the disease has not been eliminated from his body; he is therefore a menace to others. The most frequent carriers are those of typhoid fever and diphtheria.

The dust of a room may become infected, and, if the germs are not quickly killed by sunlight or by some antiseptic, they may persist and grow, and coming in close contact with a susceptible person may cause the disease. Flies may carry an infection from one person to another, or may infect otherwise good food and drink.

Intense heat and steam are found to be the most effective measures for disinfecting most articles. Spraying floors, walls and furniture with antiseptic solutions is found efficient.

Fumigation with sulphur or formaldehyde is not now often found necessary, if ordinary antiseptic measures are carried out throughout the illness of the patient. Fumigation is now mostly used in buildings to eradicate vermin of all types.

Antiseptics.—The term antiseptic is used to denote something that will prevent the growth of germs and generally will kill such germs, and is then termed a *germicide*. Most antiseptics are used in solution. Types of antiseptics are corrosive sublimate, which is a very poisonous form of mercury; several other compounds of mercury; carbolic acid; chlorine;

iodine; formaldehyde; peroxide of hydrogen; and a number of other milder preparations.

Corrosive sublimate is obtained generally in tablet form and used in solution. It is a very dangerous drug to have in the home, and if it is necessary to have such tablets or solutions they should be placed in a particular closet absolutely removed from any drug that is taken for medicinal purposes, as the number of accidental poisonings is very great and they are mostly entirely inexcusable. Carbolic acid (phenol) is another very dangerous poison, and when taken into the stomach in concentrated solutions may cause death in a few minutes.

The various chlorine preparations are much less poisonous and may be kept on hand, if deemed advisable. Peroxide of hydrogen solution may be obtained as such or under other selling names and will not cause serious poisoning. It is used diluted as an antiseptic for the throat and mouth, and undiluted for injuries to and inflammation of the skin.

For simple sterilization of an injured area the tincture of iodine has been long used, and latterly mercurochrome, which is a mercury preparation. Too much iodine has been used, and too much mercurochrome is now being used; they both tend to prevent healing of a simple injury.

If an injury is received while out of doors, and especially in the streets or on farms, iodine sterilization is advisable. Undiluted peroxide solution placed on a simple cut that is acquired inside the home or inside of a building where contamination

from tetanus (lockjaw) germs would rarely occur is always efficient. Subsequent dressings depend upon the injury. A cut, bruise, abrasion or sore should never be *permanently* sealed, with collodion, by any impervious dressing, or by adhesive plaster, until it has been shown that there is no infection shut up in the injured part. Any injury received on a public highway, on a farm or in a garden, where lockjaw contamination could occur, should be reported to the family physician or surgeon for his decision as to the necessity for the use of tetanus antitoxin.

The bite of an animal, especially a dog, cat, rabbit, squirrel, rat or mouse, or even of a spider, and of course of a snake, should be sucked and spat out, washed clean with some antiseptic solution, and a physician consulted as to the necessity for cauterization or other treatments.

It is the vogue to keep some phenol (carbolic acid) preparation in the home, as cresol or lysol. All such preparations are very deadly poisons, as they have the properties of carbolic acid. Many of them are used in dilute solution as washes for various parts of the body, but it is generally inadvisable to have them on hand, unless their use is directed by a physician.

Nasal Douching.—A fad of to-day is the excessive washing, by spraying, douching or snuffing, of the mucous membrane of the nose, and most every family uses argyrol solutions. When it is supposed that one has been exposed to some infection or a contagious cold, such treatment may be of advan-

tage, but it should not be used too frequently. The little cells that are on the surface of the mucous membrane of the nose and the secretion of mucus are protective against irritants and germs. Of course this membrane may become infected and may need cleansing, but too much washing is not conducive to its health, nor does it prevent irritants from causing congestion, swelling and subsequent colds. Also, if a real infection has become located, the mild antiseptic washes that one may safely use will rarely kill the germs.

If there is a pusy inflammation with plugging up of the nostrils and, therefore, danger of damming back the secretions into the orifices of the antra (small cavities in the cheek bones on each side of the nose) or up into the frontal sinuses, or if there is inflammation in the back part of the throat around the orifices of the Eustachian tubes (the tubes that go to the inner ears), cleansing sprays, or carefully snuffing bland liquids through the nostrils, and proper gargling of the throat are all beneficial and tend to prevent secondary infections. However, very much of such treatment should not be done without the advice of a physician, as it is very easy to force infective material into an antrum, into a frontal sinus, or even up a Eustachian tube by misdirected douching and gargling. It is always more or less dangerous to use a syphon douch in the nose, as the pressure may force liquids into any of the adjacent canals. The safest way is to spray freely, then snuff the solutions back into the throat and then expectorate. Irritating solutions

should never be used in the nose. Oil sprays, except pure, thin mineral oil, should not be used too long, as they tend to dry the mucous membrane and prevent its normal healthy coating of mucus. No one of the many nasal ointments should ever be squeezed into the nostrils. The pungency of these ointments may be utilized by smearing around the orifices of the nostrils, but the nostrils should never be plugged, lest secretions be forced into the antra. Inflammation of an antrum is always a serious, troublesome affair, and inflammation of a frontal sinus (between the eyes) is another very painful and tedious condition.

Simple sprays for one to use in an atomizer in the nostrils, when advisable, are most any one of the mild alkaline gargles that are offered. They should be diluted two or three times more than when used as a gargle. A very simple nasal spray consists of one-fourth of a teaspoonful of salt and one-fourth of a teaspoonful of bicarbonate of sodium in half a glass of lukewarm water. This solution should be prepared fresh daily. It is never wise to spray the nostrils and soon go out of doors either to be subjected to the cold air in winter or to the dust and irritants in the air in summer, unless plugs of cotton are placed in the nostrils. A weak boric acid solution may also be used as a spray.

If a child, or anyone, can not well breathe through one or both nostrils on account of some obstruction, the condition should be studied by a nose and throat specialist. No one simple thing interferes more with health than does inefficient breathing through the

nostrils. The child's face can not well develop when such is the case, and the adult acquires more colds and more throat disturbances from such a cause. If colds are recurrent there is a cause somewhere, frequently tonsil infection, frequently teeth infection, or there may be a focus of trouble in some sinus. Repeated colds must be prevented as they allow more dangerous germs to cause bronchitis or some other disease of the lungs, and colds always debilitate everyone who has them.

The vaccine treatment for the prevention of colds is rarely successful. Careful study of each person having frequent colds will generally disclose the cause, which when eradicated prevents recurrences.

Gargling.—Too frequent throat washing by gargling is not advisable. It is sensible, however, to wash the throat by such means when one has been subjected to dust and other irritants. It is not necessary to always gargle, that is, vibrate the palate. One may wash the throat by holding the head first on one side and then the other, thus cleansing the tonsils.

Strong solutions should never be used as gargles, unless there is some acute throat infection and medical advice has outlined such treatment. Recurrent tonsillitis and quinsy always show infected tonsils. They should be studied, and eradicated, if much diseased. Most any gargle is satisfactory when well diluted, if it is a simple alkaline affair, but none is better than one-fourth of a teaspoonful of salt and one-fourth of a teaspoonful of bicarbonate of sodium in half a glass of warm water. Boric acid in saturated solution always makes a safe gargle for an adult.

When one thinks he has been exposed to an acute contagious disease he may wash his mouth and gargle with peroxide of hydrogen solution, diluted with an equal part of warm water. The peroxide should be followed in two or three minutes with the soda and salt solution.

Physical Treatments

PHYSIOTHERAPY.—This is the age of physical treatments and of recommended diets for most any chronic diseased condition and for promoting and keeping health. Everyone dislikes to take medicine, except those who are wedded to some one or more *patent medicines;* and it should be noted that very many of the liquid preparations for sale in original packages, sold without a physician's prescription, contain alcohol. Therefore, one who thinks he is braced or stimulated by these liquids is generally taking alcohol. On the other hand, many of the powders and tablets, pills and capsules that are sold in original packages and without a physician's prescription to "prevent pain," "stop colds," "cure headaches," "cause sleep," "cure rheumatism," "stop neuritis," etc., etc., contain drugs that should not be much used without medical advice. Many of them are heart depressants, some may create habits, and others may interfere with digestion and cause loss of appetite. Too many cathartic drugs should not be taken, as they are debilitating and irritability of the bowels may be caused.

Seeking cures by the so-called "*drugless treatment*" of the ills of humanity (administered by men who

have *not* studied human anatomy, human physiology, human nutrition, human pathology (the study of the parts of the body that are diseased), all of which and much more must the regular physician study, for four years at least, to obtain his degree of M.D. and his license to practice medicine) has become a popular habit. The Christian Science healer does not use or advise the physical treatments of disease because he believes disease does not exist, that "there is no such thing as disease." Practically all of the other sects that treat disease and diseased conditions now employ in their offices various types of electric apparatus, which not only impresses the patient but gives him positive experiences with these physical therapies. The layman is no longer quite satisfied with "adjustment" of bones, or even with scientific massage which he may receive from one of these bone specialists either osteopath or chiropractor. The natureopath is just now in ascendency, as he has studied foods and outlines, without a scientific diagnosis, the diet for each patient.

It is self-evident that without a careful physical examination by a physician who has had from four to seven years of medical study, a diagnosis of the exact condition of a patient can not be ascertained, or the cause of his trouble discovered, and that the physical treatment given may not at all fit his case. Fortunately, a large part of these treatments is harmless. They keep the patient coming and keep him amused. Many times the advice given and the physical treatment advised is of benefit,

but serious conditions in their incipiency are not thus discovered, and should not be thus treated.

While many patients of these pseudo-practitioners of medicine improve, one does not hear of the very many who do not improve or are positively injured by such treatments. No one can consider it perfectly sensible to allow someone to treat him for some abnormal condition, which he may not have, by one who can not legally give any medicine for any internal disturbance and can not write a death certificate, if such a serious happening should occur. In other words, everyone who seeks treatment by men of the type described takes a risk which he would not take if he was building a house, employing a plumber, or seeking treatment for a misbehaving automobile. Even a pet dog, that is sick, is taken to a skilled veterinarian.

The various electrical treatments consist of vibrations, galvanic and faradic electricity, diathermy, sinusoidal currents and high frequency currents. The more potent treatments are the ultraviolet ray, the x-ray (Roentgen-ray), and the application of the very active, dangerous substance termed radium. These last named treatments should only be given by an expert after a most careful diagnosis of the condition has been made.

Various baking and sweating treatments are advocated and used in the treatment of disease, but for one to elect to take cabinet baths, hot or cold water douching, hot or cold water baths, steam baths, etc. when he is diseased, perhaps is overweight, or has high blood pressure, or feels weak and debilitated,

is not wise, except under medical advice and constant medical supervision.

Massage is a most valuable physical treatment and is best carried out by one who is skilled in this work. It should never be used on the abdomen unless the diagnosis is made that decides it can do no harm. Massage does good if one feels stimulated, elastic and rested after it. If it makes one feel nervous, it is doing harm.

Massage is one of the most valuable treatments of paralyzed muscles, if done by one who is skilled. It is of great value in the treatment of all sprains and dislocations and after the healing of fractures, in fact, skilled, careful message should be given to the muscles of a fractured arm or leg before the bones have healed. Massage should not be given to rheumatic or other types of joint disturbances unless a positive diagnosis of the condition has been made and it has been determined that it can not do harm.

It should be remembered that in any form of rheumatism, neuritis or joint disturbance (arthritis) the cause for the condition should be sought and, if possible, eradicated before resort is made to physical treatments, as they will be of little or no benefit, and may do harm, unless the cause has been removed.

Chapter XII

Prevention of Disease

In this age the necessity for clean water, for clean milk and for the supervision of all kinds of foods to prevent infection should not require discussion. The necessity for clean mouths, healthy tonsils and normal breathing through the nostrils has been emphasized. The necessity for normal bowel movements has been discussed. Nothing predisposes more to disease than anemia; therefore the blood which fights infections must be good blood. Hygienic living, normal exercise, and proper clothing all make for an increase of the withstand power against disease. Over-indulgences of any kind, whether eating too much meat, too much starch, too much sugar, drinking too much coffee, tea, or sweetened beverages, and the over-use of tobacco all predispose to disease. The skin must be in a healthy condition for normal perspiration, which also aides in continuing good health.

From babyhood up at least once a year the human being should be medically inspected, to note abnormalities and disturbances that may mean future disease. It has been emphasized that especially must the teeth be watched lest insidious infection occur in the mouth which may be the cause of very many diseases. All of the many functions of the body should be normal. If they become abnormal for the individual, medical investigation should be sought.

By *immunity* is meant a condition of the body

that withstands and overcomes the attacks of disease germs. Many kinds of immunity are inherited from parents. On the other hand, the tendency to develop certain types of disease is also inherited. Tuberculosis is not inherited, but the tendency to the development of that disease may be inherited. Cancer also is not inherited, but the tendency to the development of that dire condition may be inherited.

Hardening of the arteries before old age, at which period of life the condition is more or less normal and to be expected, is not inherited, but the tendency may be. With this tendency to hardening of the arteries also comes the tendency to some forms of heart disease, some form of kidney disease, and the rupture of arteries and apoplexy. These diseases are not inherited, but the tendency is inherited. Therefore, individuals born of parents and grandparents who die early of these diseases should be very careful not to lead too strenuous lives, and should avoid excesses of all kinds. Repeated infections, especially severe illness, as typhoid fever, may increase the tendency to arteriosclerosis (hardening of the arteries) and associated diseases.

Syphilis may be inherited, and so-called "congenital syphilis" always requires strenuous treatment. This disease is generally acquired, even innocently, and when acquired calls for immediate intensive treatment. A person who has had this disease and become cured should not marry for a number of years, and then only after careful exam-

inations have shown that he is apparently positively free from the disease.

An inheritance that is very common is that of some abnormal endocrine gland activity, and more frequently of the thyroid gland. Excessive activity of this gland is not inherited, but insufficient activity is a frequent inheritance. A thyroid gland that does not properly furnish its secretions to the blood causes the individual to grow imperfectly, mentally and physically, and also predisposes him to infections. Normal thyroid gland activity seems to be necessary to properly fight acute disease. These gland insufficiencies should be early discovered by the family physician, or by the specialist in children's diseases, and proper treatment given.

Imperfect eyes are also an inheritance. This means that near-sighted eyes, far-sighted eyes, and astigmatic eyes very frequently occur in families. Proper glasses will prevent headaches and nervous disturbances that are caused by these eye defects. It should be repeatedly noted that recurrent sick headaches are almost invariably due to eyestrain, and the oculist should be consulted and not the stomach specialist.

Natural immunity to certain diseases is acquired from the mother, and children vary as to their tendency to acquire certain infectious diseases. The mother's blood may carry substances that renders her child immune to some special diseases. This is especially the case in diphtheria, as not all children are susceptible to diphtheria; many are immune to that disease. It is quite probable that a certain

amount of immunity is given by the mother to her child against measles. Though most children are susceptible to measles, the disease itself has become milder in civilized regions. When this disease is introduced into a country that has not had it, it seems to be more dangerous.

Most people in civilized communities show signs of having some time had one or more glands of the lungs affected by tuberculosis, even without any real illness from it, and such mothers transmit to their children a certain amount of withstand power against this disease. It seems to be a fact that the disease is milder than formerly and cures are more frequent than they were many years ago. Of course the disease and its treatment are now better understood, but it seems to be a fact that the withstand power against the disease is greater than it was.

Acquired immunity is where an individual has had a disease caused by a specific infection and is from that time on immune to that disease. Many of the diseases occur but once in a lifetime; it is rare for one to have the same disease more than once. The diseases that furnish an acquired immunity and which ordinarily will not again recur are typhoid fever, measles, chicken-pox, whooping cough, scarlet fever, mumps, German measles and smallpox. Diphtheria does not seem to long protect against its recurrence in those who are susceptible to the disease. Just how long the immunity to diphtheria lasts has not been decided. It is possible that cholera, when survived, may confer an immunity. Pneumonia, influenza, erysipelas and other forms of streptococcic

infections do not render a person immune, in fact at times he seems more susceptible to these diseases.

Cured tuberculosis of the glands seems to cause considerable withstand power against the disease, but lung tuberculosis, though apparently cured, renders the individual for many years thereafter susceptible to recurrences. Patients having had the disease and had it arrested in many cases, not always, withstand recurrences fairly well, and generally can have the disease re-arrested if they take the proper treatment.

Temporary active immunity to a disease is caused by introducing vaccines into the system, and some vaccines are very positive in their protection.

Passive immunity is a term used to designate that a person who has been exposed to an infection has immediately received an antiserum, which prevents that disease from developing. In other words, one exposed to diphtheria may receive a protective injection of diphtheria antitoxin and the disease will generally not then occur, although the protection does not last.

The protections against disease are specific substances that are developed in a person's blood. These substances cause death to the germs of infection to which the person is or has become immune. In some diseases this protection lasts a lifetime. In others the protection lasts only for some months, in others for some years. It is self-evident that a person in good physical condition is better able to fight an acute infection than one who is debilitated, has poor nutrition, or is suffering from some other disease.

One of the dangers of carrying infection, as harboring infected teeth, tonsils, sinuses, or infection located in some other part of the body, is that such a person can not withstand acute disease as well as one who is not a carrier of infection. In other words, one of these carriers acquiring another disease must have his blood fight more than the attacking disease; therefore, he is handicapped, as he can not overcome the incoming disease as rapidly or as successfully as can a person who is not carrying other germs of infection.

The first reaction of the body to a germ of infection is fever, frequently preceded by a chill. This fever is what seems to start the fighting power of the system in its attempt to overcome the invading germs. Associated with this first fever are generally headache, backache, loss of appetite, often constipation, sometimes muscle aches and an increased pulse rate. Some individuals have fever with the least possible cause; others do not readily develop fever.

Vaccines and Serums. —It should be noted that protective vaccines and serums for the prevention and treatment of disease are not now expensive. Also, whenever and wherever there is a patient or a family who cannot afford to pay the price that a physician must ask, the local Board of Health in most cities will furnish these treatments without charge, or at a minimum price.

Insects

Everyone should know that *flies* are a dirty menace. Rooms should be screened against them,

and food should not be allowed to become contaminated by them. Some types of flies may cause serious irritation from their bites, but the danger in civilized communities is from what the fly carries on his feet. He sits on every dirty, contaminated, vile substance that he can reach, and may then fly directly into the kitchen or dining room and alight on food which is soon to be eaten. He can carry all types of disease germs, and especially those that cause typhoid fever and intestinal diseases. He also can carry tuberculosis germs. It is therefore essential that he should not be allowed to enter a sick room.

It is evident that the more cleanly the surroundings of any dwelling, factory, store, or other place of business the smaller the number of flies and the less possibility of their acquiring germs of disease.

It is now generally understood that the *mosquito* is another dangerous insect. His bites are very uncomfortable, but he can also be so contaminated with germs as to cause certain diseases. Certain types of mosquitoes can acquire the malarial germ and cause malarial fever. Other types, which are found especially in the tropics, can in the same way acquire the germs of yellow fever, and infect humans with that disease.

Everyone should be screened against mosquitoes when it is possible, and certainly a sick person should be screened against mosquitoes as well as flies. Mosquitoes breed in stagnant water. Such pools, whether in yards, or in hollows in fields, or water standing in empty tin cans or in gutters that do not

properly drain or in old barrels, are all breeding places for mosquitoes. Unpurified mineral oil or impure kerosene spread over pools, stagnant ponds and marsh lands prevents their development. Mosquitoes, unless carried by strong winds, do not fly more than a few dozen yards from their places of breeding, but they may be carried by individuals, animals, carriages, cars and automobiles to any distance.

Fleas are uncomfortable visitors, and when they come from certain animals may carry and cause infection. In some regions it is very difficult to prevent the acquisition of one or more fleas.

Lice of course are a disgrace and can not be tolerated. In certain regions during epidemics they can also carry disease.

Diseases

Rickets.—This is a disease of the bones that occurs in young children. Whenever parents note that the baby can not stand and walk in the usual time, that the teeth are not developed at normal periods, that the fontanel on the top of the head remains too long open, or that the child is in any other way abnormal, they should seek medical advice. If a child has begun to walk and is found to show signs of becoming bow-legged or knock-kneed, or the child does not walk properly, and his muscles seem flabby and strengthless, the advice of a physician should be sought.

It is not wise to begin the administration of cod liver oil or other types of medication, or to re-

peatedly place a child in the sunshine without some medical jurisdiction. Under no consideration should a child be subjected to home treatment with any violet-ray equipment. It should be generally understood that quartz lamp and ultraviolet-ray treatments may do serious harm, though under careful medical supervision they may be of advantage, especially where Nature's violet-ray (normal sunlight) can not well be obtained. However, too much exposure to sun rays may not only be not beneficial, but may do harm. As we Americans do everything, at the present time we are over-doing basking in the sun and obtaining sunburns.

Scurvy.—This is a nutritional disease due to the absence of a particular vitamin in the food. This is termed vitamin C, the antiscorbutic vitamin. This vitamin is in fresh milk, fresh vegetables and fruit, and especially in oranges, lemons, tomatoes and potatoes.

In the United States adults rarely acquire this disease. Formerly scurvy was a frequent disease of infants, but since the cause has become so well understood it is more or less infrequent. Infants up to one year of age are those most affected, as after that age their diet is more liberal. Mother's milk seems to contain plenty of this antiscorbutic vitamin. The amount found in cows' milk depends upon the food the cows obtain, and their milk in winter contains less of this vitamin. Pasteurizing milk decreases this vitamin C, and infants receiving Pasteurized milk without antiscorbutic food are likely to have this disturbance of nutrition.

The symptoms of scurvy in the adult are weariness, pains in the joints, legache, sore gums which may later bleed, and a sallow color of the skin. If the privation of this vitamin continues there is bleeding from the mucous membranes, serious inflammation of the gums, loosening of the teeth and anemia.

The symptoms in a child are swelling of the gums, swelling and soreness of the lower extremities, lowered nutrition, and the child becomes pale and sallow. He cries when handled, showing soreness and tenderness and painful joints.

In infants this condition of scurvy is prevented by the administration of orange juice daily, at first a teaspoonful, with sugar for the young infant,and later a tablespoonful, after three or four months of age. Fresh tomato has been found to be of value in preventing scurvy, also ordinary canned tomato is sufficiently rich in this vitamin, if a considerable amount is given. Canned fruits may not contain the vitamin in sufficient amount.

In adults oranges and lemon juice are most efficient remedies. Potatoes have also been found to be very efficient in preventing this disease.

Cough.—This is a symptom and not a disease. There are very many causes for cough. Irritation in any part of the nose, throat, larynx, bronchial tubes and lungs can cause coughing. Some types of indigestion, and rarely an irritation in an ear may cause a cough.

The character of a cough varies greatly. It may be a short hack, or a series of coughs may occur at

one time from an irritation in the back part of the throat or larynx. The cough may be dry,or mucus or muco-pus may be expelled. A cough that is dry and irritating is harmful. A cough that causes expectoration without a great amount of coughing and strain is beneficial in clearing the bronchial tubes and air passages of unnecessary secretions. In some conditions with cough there is a spasm of some of the laryngeal muscles or some of the bronchial tubes, in the first place causing croupy coughs and in the second place causing wheezing, due to asthmatic spasm of the bronchial tubes.

A very frequent cause of irritating, troublesome cough, that occurs in showers, is swelling and inflammation of the lingual tonsil. This glandular tissue has already been described. Smokers frequently have this sort of cough; also very many non-smokers have this region swollen and irritated, due to the irritating vapors that are constantly inhaled, especially in cities. So-called cough medicines will never cure this cough, unless they contain narcotics, which should not be taken except by special order of a physician. This lingual tonsil irritation is best cured by local treatment.

Reflex coughing may come from irritation in the nose, or inflammation in an ear, or from an irritated, inflamed or infected tonsil, or, as frequently occurs in children, from adenoids in the upper part of the throat.

It is self-evident that the diagnosis of the cause of a cough should be made before it can be properly treated. One should not dose himself unnecessarily

with cough mixtures which cause loss of appetite, indigestion and frequently constipation. To take medicine that is not needed is a mistake.

If one has a prolonged cough, or a recurring cough, associated with even a slight bronchitis, and especially if there are any streaks of blood from the throat or lungs, he should be immediately examined as such symptoms may be the precursors of tuberculosis. It should be noted, however, that not every little bit of blood in the sputum means lung trouble. It may be very easily explainable by some dilated or injured blood vessel oozing a little blood into the throat or upper air passages. Sudden or continued loss of weight is always a symptom that needs investigation.

Whenever anyone coughs or sneezes he should hold his handkerchief before his mouth and nose. It makes no difference how simple the condition may be, the fact remains the same that care should be taken not to spray the atmosphere with droplets that may carry germs to cause infection of others.

It can not be too much emphasized that frequent causes of recurrent colds and recurrent coughs are infected teeth and tonsils, infected sinuses, and abnormal conditions in the nose.

Colds, Influenza and Pneumonia.—All colds, sore throats, influenza and pneumonia are what is termed communicable. In other words, they may be transmitted from person to person by close contact, and close contact means carelessness in coughing and sneezing into the atmosphere; using the same eating or drinking utensils; using telephones which

have not been protected from infection; kissing, etc., etc. Mothers should not use a handkerchief for a child who has a cold and then use it for another child; or if she has a cold herself she should not use her handkerchief to wipe the child's nose. Tooth brushes can carry many germs of infection; this should be remembered.

One of the most communicable diseases is *influenza*, and it is rare for a real case of this disease to occur in a family that others do not develop it. The disease spreads rapidly in offices, in stores and in factories, where real cases have occurred. While an ordinary cold may not call for the patient to remain in the house, influenza does require that he remain at home, even if he is not ill enough to go to bed. Nothing prevents an influenza attack from becoming severe more than giving up to it on the first day.

Pneumonia germs are always with us, and many people are carriers of these germs. Hard colds, and especially influenza, predispose to the development of pneumonia.

There are several types of pneumonia, one type of which is now treated by an "antiserum," that is, an antitoxin that is injected through the skin. It should be emphasized that pneumonia is a communicable disease, and necessitates the same care of the sputum, of coughing or sneezing, of handkerchiefs, and in the use of eating utensils as does tuberculosis.

Hay Fever and Asthma.—Hay fever, as is known, is due to certain types of pollens that occur at different times of the year, depending upon the

climate. In the temperate climate it occurs mostly in the summertime, in June as a "rose fever," so called, and in August and September as a ragweed fever, termed "hay fever." Various other dusts and pollens may cause hay fever and asthma.

After determining the exact cause of the hay fever in any one person by skin tests, vaccines prepared from this particular pollen may be injected hypodermically, in a series of perhaps a dozen injections from eight to twelve weeks before the expected irritation is to occur. This treatment is generally successful in preventing the attack that year but usually it does not prevent an attack the following year, unless the vaccines are repeated.

A frequent cause of hay fever, as well as of *asthma*, is some abnormality in the person's nose. Consequently the condition of the nose should always be investigated in these cases, as asthma and hay fever may be cured by proper treatment of abnormal nostrils. Infected tonsils, teeth and sinuses may cause asthma and aggravate hay fever attacks.

Closely associated with hay fever and asthma are the symptoms produced by different types of food; goose, chicken and other feathers; horse hair and the fur of cat, squirrel and rabbit, and by emanations from these animals; and goat hair, which is often used for dolls' hair, may cause these symptoms. Certain types of dust in rooms may be a cause of asthma. Emanations and odors from some flowers and plants, and from toilet powders and perfumes may all or any one be found guilty of causing asthma in certain individuals. The foods found guilty

should be avoided. The same is true of plants, feathers, furs and other emanations. The nose often requires special treatment.

Vaccines are rarely of value in asthma except occasionally, when the cause is some bacterial infection. All localized infections should be eradicated and a healthy, hygienic life lived. Every case of asthma requires careful medical investigation and generally medicinal treatment.

Tuberculosis.—Any enlarged gland in the neck of a child, or any joint trouble should cause the parents to take the child immediately to a physician. These conditions may be due to the tubercle bacillus, and serious developments will be prevented if there is no neglect in these cases. Any unusual paleness, loss of weight, flushing of the face, or loss of appetite for the evening meal should call for investigation, whether or not there is a cough. All prolonged coughs, and blood in the sputum at any time, require medical decision as to the cause. The cause may be tuberculosis. Any discharge from the ears or loss of hearing should be investigated. Frequent and recurrent colds may have some simple cause that can be removed, but repeated colds and repeated attacks of bronchitis or hoarseness, if not due to tuberculosis will make one susceptible to that germ.

Good hygienic surroundings are necessary to prevent the conditions that lead toward tuberculosis. There should always be plenty of air at night, but cold or damp winds should not be allowed to blow on a person. Sleeping porches are valuable and

often advisable, but too much cold air for young children is inadvisable.

It should always be remembered that tuberculosis in any form, if early diagnosed, generally has a good prognosis. Cure is frequent under proper prolonged treatment. Tubercle bacilli having been discovered in the patient's sputum calls for care to prevent the infection of others by rules and regulations that are given by the doctor and the Board of Health. With such care other persons will not be infected, and they need not be afraid of being near a tuberculous patient.

Typhoid Fever.—Typhoid fever and its associated germ fever, paratyphoid, are preventable diseases. They are acquired principally by contaminated water and milk. The germs also may occur in butter, ice cream, ice, and on green vegetables which have been washed with contaminated water, or which are grown where such germ contamination can reach them. Therefore, vegetables that are eaten without cooking, even though they are thoroughly washed with pure water, may occasionally cause infection with one of these diseases. Flies may carry typhoid fever germs on their feet and thus contaminate food and drink when exposed to their inroads. The fly is a germ carrier and always a menace. Oysters and clams fattened in sewer-contaminated water may also cause one or both of these diseases.

It has been positively demonstrated that typhoid vaccines injected into an individual protect him for at least three years from typhoid and paratyphoid

fevers. Often the protection lasts longer. It is rare for such a protected person to become infected, and if he does the disease is very mild. If one has had typhoid fever he is generally immune throughout the rest of his life. A test may be made with his blood which will show whether or not he is protected, if there is a doubt as to what fever he may previously have had.

Not infrequently *carriers* of typhoid germs are found, and a carrier is very dangerous as a distributor of the disease, of course innocently. Therefore every care should be taken that one who has this disease is free from this germ before he is declared cured and dismissed from observation.

Whooping Cough.—Vaccines have been developed to combat and prevent this disease. In some cases these injections seem to shorten the course of this children's disease and to render it milder. Children who have been exposed to whooping cough have been vaccinated, and in many instances it has seemed to prevent the occurrence of the disease. The protective influence, however, of whooping cough vaccines has not been accepted by all sanitarians as of positive value.

It should be known that whooping cough is not a simple affair. It is the indirect cause of more deaths than some of the more serious diseases, as it tends to leave the child, for a time at least, susceptible to colds and to tuberculosis. Also the severe coughing may do harm, and for this reason it is more serious for an adult to have whooping cough than for a child, as he coughs harder.

Diphtheria.—When the treatment of this disease is immediately begun with the proper dose of antitoxin, it ceases to be a dreaded disease. It can almost positively be cured, if the case has not been neglected. All exposed persons should receive the dose of antitoxin that is recommended to prevent the development of the disease.

At the present time children are being tested by the Schick skin test to determine whether or not they are susceptible to the germ that causes diphtheria. Many are immune to the disease. Those who are susceptible have a certain reaction to the skin test. Such children are given a protective vaccination which will prevent the disease from developing for some years. They should occasionally be tested again to see if they are still immune. Diphtheria, it is hoped, will before many years be entirely eradicated in civilized communities.

There are so-called *diphtheria carriers*. These are individuals who have had diphtheria but who have not been completely cured and still carry the germ in some part of the mouth, tonsils or nose. Some persons are carriers who have never had the disease but have simply acquired the germ and have not eliminated it, but have immunity enough to prevent the acute disease. One who has had diphtheria can not be released by the Board of Health until tests have shown that he is free from this germ.

Scarlet Fever.—The Latin name of this disease is "scarlatina." It has long been a mistaken idea of the laity that scarlatina is a mild form of scarlet fever. They are interchangeable names.

Recently there has been developed an antitoxin for this disease which modifies its severity; it should not be used in mild cases. There seems to be no special way to prevent the occurrence of the disease, that is, to protect against its development, except that of not harboring diseased tonsils. Diseased tonsils easily acquire or carry the germ that is the cause of scarlet fever. Scarlet fever is one form of streptococcic infection, and streptococcic infections are also causes of erysipelas and of many types of blood poisoning and of septicemia, which is a septic fever due mostly to streptococcic germs.

Measles.—This is a disease that always requires careful supervision. It is never a simple, harmless affair, causes many deaths, and is one of the most contagious of diseases. In 1926 the deaths from measles in the United States, in the registration area, was 8607. The disease is spread by secretions from the mouth and upper air passages.

At the present time there is no positive method of preventing this disease though an antiserum is on trial, but its ultimate success has not yet been determined.

Mumps.—This disease is generally not serious but it may cause death in rare instances. In adults it is more severe than in young children, and may cause serious complications. It spreads by close contact with secretions from the mouth. There is no antitoxin for mumps.

Smallpox.—Vaccines are made from dead bacteria, and a vaccine for any one disease is made from the bacteria that cause that disease. A vaccine is

generally injected under the skin. The oldest vaccine is that which prevents smallpox, and that this disease is prevented by vaccination has long been proved and is incontrovertible. Jenner, of England, discovered this fact and offered it to the world in 1796. At the present time the vaccines for smallpox are made absolutely pure, and, if they are properly administered and the resulting sores properly cared for, there will be no danger of any secondary infection. The scar is now made very small and the reaction to the vaccination is very slight. Every child should be vaccinated before or soon after it is six months of age, preferably during the cooler months. Revaccination should be done at six or seven years of age, and then every ten years it is well to repeat the vaccination. Also, if there is an epidemic of smallpox and one has been exposed to the disease, or is likely to be exposed, he should be vaccinated as a precautionary measure. Some persons never react to a second vaccination; they are immune and protected.

The discomfort caused with the primary vaccination in the way of fever and a sore arm is slight in almost all cases. Occasionally more disturbance is caused and the individual should be at rest for a day or two. Vaccination on the leg is inadvisable, especially if the person is to be up and about, as the reaction is greater than it is when the vaccination area is on the arm, which can be better cared for and be more at rest.

As stated, the protection against smallpox, which was for many years a most frightful epidemic and

caused thousands and thousands of deaths, is almost absolute. A properly vaccinated person almost never acquires the disease of smallpox, and if he does, it is very mild in type. One who has had smallpox is thereafter immune to the disease.

Lockjaw (Tetanus).—This disease occurs from an infection that is mostly acquired by injuries occurring in the street, or on farms, or in gardens where manure has been used. Any abrasion or cutting of the skin occurring in these places should be very carefully treated. The wound should be immediately washed with peroxide of hydrogen solution, or mercurochrome or iodine should be applied. The wound should not be sealed, but should be carefully dressed with clean gauze, and a physician consulted. If, in his opinion, there is any danger at all of the tetanus bacillus having been acquired, tetanus antitoxin should be administered. Lockjaw can be prevented, but it is almost impossible to cure it after it has developed.

Hydrophobia (Rabies).—This is a very serious condition that is acquired by the bite of a "mad" dog or other similarly diseased animal. As soon as a person has been bitten by such an animal a physician should be immediately sought and he will advise the proper treatment. The bitten part may be constricted, if possible, so that the poison will not reach the general circulation, and the bitten part may be soaked with peroxide of hydrogen or with mercurochrome solution. Iodine is not always advisable for flesh wounds, as it may prevent healing, but if no other antiseptic is at hand, iodine may be used. If

the biting animal is known to have, or is supposed to have had hydrophobia, vaccines against the development of this disease should be immediately used, according to the physician's orders. If a physician can not be immediately obtained, the Board of Health should be consulted for the proper advice and treatment.

Chapter XIII

Habits

Narcotic Drugs.—A most serious thing in all civilized countries is the addiction to opium, morphine, heroin and cocaine. In spite of laws governing the sale and limiting the importations of these narcotics, the habit of taking these drugs has increased, and, in the United States, in spite of the Harrison Narcotic Law, the increase of the morphine and heroin habits has become a menace.

In this country there is probably very little real opium smoking. The habit-forming narcotics used are morphine, heroin and cocaine. Morphine and heroin, as soon as the habit is formed, do not act as narcotics; in other words, they do not, except in large doses, cause sleep, but on the contrary they act as stimulants. This is true of all those who have the habit. Cocaine is, unless in poisonous doses, always more or less stimulant and causes the most dangerous habit of them all. As restrictions were many years ago put upon the sale of cocaine in the United States, the cocaine habit probably is not at the present time very frequent, but the morphine and heroin habits have enormously increased. Not a few take both morphine and cocaine. The most pernicious of these drugs is heroin, because the habit is so quickly formed and is so much on the increase. Morphine is the most active ingredient of opium and is prepared from opium. Heroin is a drug that is prepared from morphine.

Hugo L. Black, of Alabama, discussing in the Senate of the United States the peril of narcotic drugs, in January, 1928, made the following statements. The heroin problem is spreading with inconceivable swiftness in the Western world, while in the Eastern world the consumption of opium is the greatest problem. "Addicts in the Orient are numbered literally as tens of millions, and in the Western world the ravages of heroin addiction are fast getting beyond control." Drug addiction is the cause of the rise in crime in boys and girls from fourteen to seventeen. "The human race is consuming every year many thousands of tons of poisonous narcotic drugs not one per cent. of which is necessary for strictly medicinal purposes. Nearly all of this great quantity is consumed by addicts, who number in the world scores of millions." The motive that increases the traffic in narcotic drugs is the enormous profit to the jobber and retailer. This profit is caused by the necessity for the poor addict to obtain his drug at any price.

The poppy, the source of opium, is a native plant of Asia and Southeastern Europe, and its poisonous properties were noted in ancient and mediaeval records. Opium smoking seems to have been started by the Dutch in Java in the eighteenth century. From there it went to Formosa, and then to the mainland of China. Portuguese traders first developed the importation of opium into China. Later, the East India Company took over the opium traffic from India into China, and in 1858 the amount shipped into that country was ten million

pounds. "In 1906 the production in China itself was estimated at forty-four million pounds, importations from India that year being over seven million pounds. At that date estimates placed the number of addicts in China at 27 per cent. of the adult population."

Morphine was produced from opium, in 1803, by a French chemist, and about fifty years later an American chemist discovered how to produce cocaine from coca leaves. In 1898 a German chemist produced heroin from morphine.

Heroin in this country, especially in Eastern United States, now goes under the slang name of "snow," and "snow parties" are held. Heroin is peddled to innocent people, especially children, under the term of "headache powders," and young girls and boys, as well as adults are offered a "sniff" or a "blow" of "snow" (heroin), or asked to "take a shot," which means a hypodermic of morphine. Heroin is often given away to youth until he or she is "hooked." A whiff, or some other method of taking "snow," daily for a week generally starts the addiction habit. The transformation of the character of the youth or person addicted to heroin is almost unbelievable. All good home and hereditary influences are lost, self-respect is gone, "honor, obedience, ambition and truthfulness melt away, and virtue and morality disintegrate." To get his drug the addict will lie, steal and rob, and may even commit murder, and he will dare anything to get the drug he needs, hence the increase in hold-ups and other crimes. A peculiar characteristic of the heroin

addict is his desire to make somebody else become an addict; hence the rapid spread of this terrible menace. While in the young addict, girl or boy from sixteen to twenty, heroin is generally the cause, the morphine addict is generally an adult.

At Sing Sing prison from 1918 to June 1922 there was an increase of 900 per cent. in the number of addicts admitted to the prison, and there has been a radical increase since that date. Owing to secretiveness, the number of addicts in this country is very difficult to estimate. Probably the lowest estimate is one million.

Doctor Carleton Simon, the special Deputy Police Commissioner of New York City, estimated that while only 58 ounces of heroin were lawfully prescribed in one year by physicians in New York City, 76,000 ounces were consumed. "Two thousand young addicts can be created with one ounce." In New York City 60 per cent. of all inmates of correctional institutions were addicts or narcotic cases. The number of addicts in New York is estimated to be 200,000, and court records show that most of these addicts are heroin takers, and are in their teens or early twenties. Also, New York has reported that most of its daylight robberies, hold-ups and crimes of violence are perpetrated by addicts.

Many serious illnesses, associated with pain, require morphine to be used as a medicine, but in such conditions it is under the control of a physician. In some serious painful illnesses, notably cancer, the patient may need the morphine and form the habit, but it is a justifiable habit. These medical

instances, however, are few and do not cause any menace to the community, and such cases never instigate the use of the drug by others. Therefore, when any physician decides that morphine is needed by any patient, the family should not be disturbed or feel that future harm will be done. If in some acute condition morphine must be given constantly enough to cause a habit, this short-lived habit is easily cured by the physician.

The most insidious of these poisons is heroin, and, fortunately, there is no need for this drug to ever be used as a medicine. Consequently, the importations into this country and the sale of heroin in this country are without medical necessity.

Those who become addicted to the use of heroin or morphine generally increase the size of their doses until they can stand an enormous amount, an amount that would very quickly kill persons who had not become tolerant to these drugs. Some sort of an immunity is caused by their continued use, either by mouth or hypodermically, and the stimulating reaction is lessened unless the dose is increased. Finally a large dose is required and must be frequently repeated.

These narcotics interfere with nutrition, digestion and excretion. They interfere with muscle and nerve activity and sooner or later cause deterioration of mentality. They are harmful from start to finish, although some few individuals may be able to take morphine, daily, for many years without serious, evident harm. Youth and young adults can not take these drugs without soon showing evident harm,

and the most harmful is heroin. As above stated, cocaine is more expensive and now less frequently used.

If one is deprived of his habitual drug, more or less serious symptoms immediately occur. He has muscle and joint pains, vomiting, diarrhea, cough, sleeplessness, sometimes delirium and even convulsions. Very few can be cured of one of these habits without entering an institution that is prepared to scientifically treat these cases. The best of judgment is required as to the method and the rapidity of the withdrawal of the drug.

A large number of the terrible crimes that are described almost daily in our newspapers are committed by those who are addicted to drugs. Young boys first become cigarette fiends, then they often start the "dope" habit, and many finally land in the courts of justice, unless they have previously become ill and land in the hospitals.

The most malicious among the criminal classes are the vendors of these narcotic drugs, especially heroin, to youth. In some instances it has been found that the drug is given away in candy, or in some other form, to school children. Every child, youth and adult should be cautioned against taking anything offered them by any stranger, unless he positively knows of what it consists.

Tobacco.—The consumption of tobacco in the United States has enormously increased in the last few years. In 1921 Professor Henry W. Farnam, of Yale University, computed the annual tobacco bill of the United States as being $1,600,000,000. This

was for tobacco only, and did not include the amount spent for accessories, such as pipes, etc. This meant at that time the average cost per year for every man, woman and child in America was $16.00. The Internal Revenue Bureau reported that in 1922 taxes had been paid on almost 600,000,000 more cigarettes than in the year 1921. In 1923 there were 7,000,000,000 more cigarettes manufactured than in 1922, this enormous increase being thought to be due to the large number of women who had begun to smoke. In 1924 Senator George P. McLean stated in the Senate that in the fiscal year 1923 the United States had spent $500,000,000 for cigars, $800,000,000 for cigarettes, $800,000,000 for tobacco and snuff, and $3,000,000 for cigar and cigarette holders.

In June, 1926, newspaper reports stated that in the previous month (May, 1926) there were sold in the United States 7,000,000,000 cigarettes. Calculations made in Paris, reported in the New York Times, September 2, 1928, showed that in France the annual consumption of cigarettes per capita is 270, in Germany 600, and in the United States over 800.

James C. Young, discussing the tobacco question in the New York Times Magazine, March 11, 1928, stated in that year, namely, 1928, the American people would smoke about 100,000,000,000 cigarettes or roughly six times the amount consumed in 1914, and 3,000,000,000 more than in 1927. He also stated that, in 1927, $54,000,000 were spent in advertising three brands of cigarettes. A still more recent report (January 30, 1929) from the Internal Revenue

office at Washington showed that there were sold in the United States, in 1928, the enormous number of 105,925,765,650 cigarettes.

Considering the number of cigarettes smoked in the United States in one year and estimating the number of matches used to light these cigarettes, is it any wonder that the fire menace in this country is simply tremendous? It probably is not far from the correct figures to state that about twenty per cent. of all fires in the United States are due to smokers, to say nothing of the enormous loss from field and forest fires due to the careless throwing away of lighted matches and lighted cigarettes and cigars. Professor Farnam found, in statistics collected in 1921, that one city dwelling in the United States was destroyed by fire every four minutes; one farm building every seven minutes; and one hospital, five churches and five schoolhouses burned down every day.

The United States Forest Service investigated the forest fires of Oregon and Washington[1] and found that 293 man-caused fires had occurred in the forests of these two states during the spring and summer of 1928. One hundred of these were started by careless smokers. They found that in dry grass on the average one of every ten lighted cigarettes will start a fire.

The Forest Service also stated that in the United States there are 171,232 cigarettes smoked and discarded every minute, day and night, for the entire year. Even if only one-third of these cigarettes

[1] Literary Digest, Oct. 6, 1928, p. 22.

are smoked out of doors, there would be over 50,000 chances a minute for a fire.

The New York Times[2] estimated that 203,000 cigarettes are used each minute.

The fine sense of courtesy and thoughtfulness for others seems frequently to be lost by even the best of men who smoke excessively. This is particularly noticeable in cigarette smokers. Discourtesy is not intended, but inexcusable thoughtlessness is evident.

Smoking at the present day by school and college girls, by clerks, office girls, factory girls, nurses and even teachers is deplorable. A number of the colleges for women have created smoking rooms for their students.

There can be no question of the harmfulness of young mothers smoking either during pregnancy or during lactation. Also it would seem to be a physiologic as well as an esthetic question whether a mother's breath should be impregnated with tobacco during the period in which she cares for and fondles her infant child, even if she does not care that her older children see her afflicted with this unfeminine habit.

Anyone who over-smokes loses efficiency for mental and manual work, and this is especially a fact in the mental efficiency of growing boys and girls who smoke. Young girls have not been smoking long enough for a study to be made of the effect on their school work. Such, however, has long been studied in boys, and it has been found that cigarette-smoking boys can not do as good mental work as

[2] The New York Times, Nov. 25, 1928.

the boys who do not smoke. Delinquent boys, and those who reach the courts, are practically all cigarette smokers. Most youth and young adults who become morphine, cocaine or heroin addicts are cigarette smokers. Many factories and offices prohibit smoking during working hours, as tobacco interferes with speed and efficiency. Every athletic trainer of young men abolishes the use of tobacco in those he trains until the athletic tests are over.

Nicotine, the active constituent of tobacco, is a very dangerous poison. Fortunately, the tobacco smoker inhales but little of this poison at any one time, although he inhales sufficient, if he is a novice, to cause nausea, depression, faintness, cold perspiration and sometimes even collapse. Death occasionally occurs from such poisoning. If the smoker persists in the use of tobacco he acquires a tolerance, and these unpleasant and dangerous symptoms do not occur.

There is a varying amount of nicotine in tobacco, and cigars especially vary greatly in their content of this ingredient. The darker the wrapper, generally the stronger the cigar. Cigarette tobacco also varies in the amount of nicotine that it contains, and to some is added some sweetening stuff. There must be some positive reason why an habitual cigarette smoker always desires the brand to which he is accustomed and is not satisfied with any other brand.

For some time now there has been offered what has been termed "denicotinized" tobacco. Suffice it to say that tobacco can not have its nicotine wholly removed, although it may be possible to re-

move a certain amount of it. Therefore, if anyone has been told by a physician that he should not smoke, he should not believe he can smoke tobacco termed "denicotinized" without harm.

Smoking has two very positive effects on one who is used to tobacco and is not being injured by it. One effect is to temporarily raise the blood pressure, although the blood pressure is lowered in those who are not used to tobacco, and it may be lowered in those who are over-smoking. The second effect is a narcotic one, namely, it lessens nervousness and causes mental quietude in those who are used to smoking. If one who is used to tobacco suddenly stops smoking he becomes nervous, often sleepless, constipated, and is generally miserable for a time until he is weaned from the habit.

If a smoker is over-tired he gets comfort out of another smoke. If he is a cigarette smoker he keeps taking another cigarette. The second stage of over-smoking is one of nervousness; sleeplessness; headache; often palpitation of the heart; often perspiration, especially of the hands; sometimes cramps in the muscles, especially of the legs; loss of appetite and indigestion. Frequently catarrhal conditions are increased, and especially is irritation of the larynx and the lingual tonsil (which is glandular tissue located just above the larynx at the base of the tongue) caused. These persons have a tickling, dry cough, without much expectoration. If over-smoking is persisted in, often heart pains occur with loss of weight and a lowered blood pressure. The individual becomes pale or yellowish in color and is always tired.

He tries to brace up with an extra amount of coffee or tea, and keeps increasing his smoking. Over-use of tobacco may even cause disturbances of the eyes. Sometimes there is sufficient weakness of the heart muscle to cause some dilatation and even a heart murmur may occur.

If tobacco is stopped in these cases, almost invariably all the above conditions will improve, with the help of proper medication and careful nutrition. Sometimes it is necessary to give one or more drugs to diminish the nervous irritability caused by stopping the tobacco.

Smoking in youth diminishes the normal growth of the heart and lungs. It sooner or later impairs all muscle activity as well as interferes with mental improvement. Older youth may smoke cigarettes in small numbers without apparent harm. In other words, tobacco is always harmful to young boys and girls up to the age of eighteen, at least. After that age a small amount may not be harmful to boys. Adults may smoke with comfort and pleasure and without harm a normal amount of cigarettes, cigars or pipe. Generally, cigarettes are the most harmful because their smoke is generally inhaled, therefore the small amount of tobacco in the cigarette has more intense action than when the same amount of tobacco is smoked and not inhaled.

The question is frequently asked, what is excessive smoking, or how much can one smoke without harm? The answer is purely an individual one. One cigar may do as much harm to one person as seven or eight will do to another. In other words, each one is a

law unto himself. One must always consider, however, that more than six cigars a day is excessive; more than twenty cigarettes a day is excessive, and even these amounts represent altogether too much tobacco consumed. Three or four cigars a day should be a maximum, and ten or twelve cigarettes a day should be a maximum, for adults. If one smokes directly before an expected meal, or smokes while he is preparing for bed, or smokes while he is dressing in the morning, or must rush out between every act of a play and smoke, or can not go one or two hours without smoking, he is smoking excessively.

Chapter XIV
Accidents

The subject of accidents and *industrial fatigue* has been carefully studied, especially in England. It has been found that there is great variation in individuals as to the number of accidents they have, even those working side by side at the same occupation. One may be working in a comparatively safe occupation and have more accidents than another working in a dangerous occupation. In other words, there seems to be a personal factor which causes accidents. It is an indifference to risk, unusually slow movements or incoordinated movements, or quick fatigue after a short period of work, or defective eyes, defective ears, pain, or any diseased condition that interferes with perfect vitality and mentality. Accident-prone individuals should be warned against occupations that are dangerous, especially working with machinery. It has been suggested that too many safeguards and precautions and rules and regulations will interfere with the operators quick use of his own brain, as a man giving a high intelligence test may have more accidents than a man with a lower intelligence test.

Probably the most frequent cause of accidents is fatigue or weariness, mental or physical, often caused by late hours and lack of sleep. There is always with us the type of individual who, to classify by a slang phrase, is one who "does not know that it is loaded." He is always taking chances largely

through utter indifference and lack of forethought, always injuring himself or allowing others to be injured, or by some omission or careless commission causing accidents to others as well as himself. One who is frequently sick seems to be prone to accidents.

It has been found in many industries that rest periods are essential to prevent accidents and to increase the output of the industry. Most accidents occur in the latter part of the morning, and still more in the latter part of the afternoon. This shows fatigue of muscles and brain. Therefore, rest periods have been introduced; change of occupation, or temporarily going to another part of the factory tends to cause rest and to prevent accidents. There is a great difference in the amount of rest individuals need before the fatigue is removed. With some short rest periods are sufficient; others require longer periods. Any change of occupation or change of muscle activities is restful. Some muscles are fatigued more easily than others. Ordinarily, the more swift or severe the work, the longer the rest period that is needed for recovery.

Fatigue may be due to toxins produced in the muscles by their activity, which are not rapidly enough eliminated to prevent tire, or it may be due to mental intensity or high tension during the occupation. Such conditions generally require, with a well person a very short rest for at least temporary recovery. Any change of muscle action is helpful, and any mental relaxation, especially relaxation of the eyes, quickly causes recovery. Hard, intensive mental work, even for as short a time as half an

hour, may require an hour for complete recovery from the mental fatigue.

Ordinarily a rest period should occur after about two or two and a half hours of work, and the length of the rest period may vary from ten to fifteen minutes. Too long rest periods have been found not to increase the output of work, but seem to cause too much relaxation, and the person has to again get into working activity. Hard mental activity requires frequent rests such as occurs with the intensive work of a telephone operator or an inspector of standardized output. Sitting or standing in a strained position during work requires more or less frequent changes of posture and relaxation to prevent tire. During the rest periods complete relaxation, doing nothing, seems to be most beneficial.

Tragedy.—There are approximately 15,000 *suicides* in the United States annually. The last federal census showed there were nearly 300,000 persons in the United States in hospitals for the insane. The estimate was that there are 75,000 new admissions to these hospitals annually; that is, 75,000, each year, of the citizens of the United States have mental breakdowns.

The cause of suicides may be classified as: those due to incurable disease; those due to great financial loss and consequent mental depression; those due to brain disturbance from some previous inflammation or injury; those due to endocrine gland disease; those due to depression from home clashes and serious home incompatability; those due to sorrow; and those due to occupation misfits.

Disturbances of the mentality or actual cerebral disease may cause homicides instead of suicides; or in the large majority of cases cause some form of insanity that leads to confinement in a sanatorium or insane asylum.

The methods that should be taken to prevent these serious mental disturbances are suggested by the above causes, and many so-called incurable diseases may not infrequently become cured. If the disease is a painful one, proper treatment should prevent any idea of suicide.

When great financial loss is suffered the immediate relatives and friends should take means to relieve the mental depression and help direct the person's outlook in new directions. It should be recognized by all that injuries to the head or diseases that affect the brain should cause special observation and medical management to prevent, if possible, future mental disturbance.

It should be recognized that endocrine gland disturbances, especially of the thyroid, may cause abnormal mental attitudes and actual cerebral disease. A physician should be consulted by the family as soon as any mental abnormality is noted in one of its members. Also proper supervision of childhood and youth, who show endocrine disturbances, may prevent serious consequences later in life.

An unhappy home life is one of the greatest causes of mental abnormalities. There can be no mental health or mental or physical normality in those who are living in such households. If the home

rankling and clashes can not be overcome and prevented, the household had better be broken up. This is especially true where there are children, who, being brought up in such an atmosphere, become handicapped for their future lives.

A very serious cause of *mental breakdown* is that many persons are not fitted to the occupation in which they are employed. Much study has been given to this branch of what may be termed mental hygiene. This is sometimes termed psychologic investigation, which is a branch of medicine that should be developed. It has been repeatedly found that an unhappy person studied and then placed in an occupation for which he is fitted immediately has a different viewpoint on life. Also, the individual's occupation output is greatly increased, if he is placed at congenial work.

It is to be hoped that in the future young boys and girls will be studied and directed to prepare for and enter into the occupations for which they are fitted. This does not mean so-called "intelligence tests," which are in a majority of cases fallacious. It is impossible by these tests to accurately classify and rate an individual unless he is super-excellent or an actual moron.

An important cause of both suicide and insanity is sorrow, either real or perpetuated by an abnormal viewpoint on life, or by what often seems an actual enjoyment of the perpetuation of some previous sorrow, a pose, the individual seeking sympathy. Finally the individual becomes morose, nutrition and mentality are impaired, and the future is at

least a hypochondriac, and often the form of insanity termed melancholia. In this condition a radical change in the home life or occupation, or moving into another region, or travelling if the individual has the financial ability, will cure the abnormal condition. It may be that treatments especially aimed at instilling hope and new ideas into the mental sufferer, by any method found best, offer the best means of cure.

At the present time so-called psychopathic wards are being added to general hospitals for the treatment of those who are in the first stages of mental disturbance, and it should be emphasized that there is no more disgrace for a patient to have a tired or disordered brain than for him to have a tired or disordered heart; it is simply another organ that is affected. It is a serious mistake to send such cases to an insane asylum, with the stigma that at the present time is attached thereto, when a shorter or longer stay in a general hospital, in the psychopathic department, will very many times effect a complete cure of the abnormal mental attitude. Such patients should be very carefully studied, from every possible standpoint, to discover, if present, local chronic infection, chronic disease, or a pathologic condition that is causing the mental disturbance. A defect found and treated may alone correct the mental abnormality. On the other hand, if these mentally abnormal individuals are immediately shunted into some hospital for the insane they are not likely to be thus studied and the diseased brain, at first curable, becomes incurable.

The person has thus lost his right to the possibility of cure and becomes a charge on his family or on the state. Such treatment is inhuman and reprehensible. When a patient is taken suddenly violently insane and is a danger to himself and others, he must of course be immediately confined in a part of a hospital that is prepared to take such cases. Even these sudden outbursts of mania may be cured, if the cause can be found and eradicated.

Management of Emergencies

If anyone is found unconscious, it may be due to an injury, to poisonous alcohol, to apoplexy (a stroke), to epilepsy, to kidney disease, to diabetes, to over-heating, to gas poisoning, or to poisoning by some drug.

The first thing to do is to telephone immediately for a physician. It is also well, in very many cases, to send for an officer of the law. Either one of these persons will take charge of the case and direct the proper management. If the person is thought to be dead, he must not be moved until someone in authority arrives. If he is alive, he may be carefully placed where he will be the most comfortable, that is, out of the sun, or off the street, or on a bed or couch. Anything suspicious in the surroundings must not be handled or touched by anyone until some person in authority decides what shall be done. In a case of illuminating gas poisoning the windows must of course be immediately opened, and the source of gas leakage stopped. If the person is found insensible in a garage, due to inhaling gasoline ex-

haust, the engine must be stopped and he must be taken immediately into the outside air. If he is alive, his collar and any restrictions around the throat or chest must be loosened. It is never advisable to raise his head; he should be allowed to remain flat. If the person has become comatose from illuminating gas or from garage exhaust gas, anyone who understands first aid treatment should begin artificial respiration. The odor of alcohol on the breath does not necessarily mean that alcohol has caused the coma.

SUNSTROKE.—In case of sunstroke the victim must be immediately moved to the nearest cool, shady spot.

If the person is known to have fainting attacks, or the attack seems like an ordinary faintness, or he has been subjected to intense heat and the condition is *heat prostration*, some stimulant may be given, as half a teaspoonful of aromatic spirit of ammonia in water, or twenty drops of spirit of camphor in water, or smelling salts may be used, but not held too close to the nostrils and not too long if he is stupid. In all such cases the person must be moved with great care and kept flat on his back, and all clothing around his throat must be loosened.

If the person is known to have taken some poison, by design or by mistake, the immediate administration of an emetic, before the physician arrives, is justifiable and proper. If the person is a child, the safest emetic is syrup of ipecac, and the amount that should be given is one, two or three teaspoonfuls, in water,

depending upon the age of the child. If vomiting does not occur within ten minutes the dose should be repeated. If the poisoned individual is older, the best emetic is mustard, a tablespoonful or more stirred into a glass of warm water. After the first vomiting has occurred, he should be given plenty of warm water to drink, to continue to wash out his stomach.

If a child has a convulsion and is known to have eaten only a short time before, it is well to empty the stomach with a dose of ipecac. All subsequent treatment of any patient found in convulsions or insensible must be carried out by a physician.

DROWNING.—As soon as a person who has only recently succumbed in the water has been rescued the immediate treatment consists of getting the water out of the lungs and beginning artificial respiration. To let the water run out of the lungs and possibly the stomach, the body may be suspended for a few minutes by the heels. When water has ceased to run out of the mouth, the person should be placed on his side, the nose cleaned and the mucus removed from his mouth with a handkerchief.

The victim is next rolled onto his abdomen, with the head turned to one side and resting on one arm. The one who is to do the *artificial respiration* then sits at the side of the patient, and makes firm pressure inwards and upwards on the body, the hands being broadly placed laterally against the region of the lower floating ribs. The pressure should be exerted for three seconds. After three seconds the pressure should be released, which causes the chest

to expand and air is sucked into the lungs. This alternating pressure and release of pressure should be repeated fourteen times a minute. This artificial respiration may cease, if the patient begins to breathe. He may then be turned upon his back, but care must be taken that his tongue does not fall into the back part of his throat; it should be held by the fingers with a handkerchief until the patient is able to manage his own breathing. If he does not continue to breathe, artificial respiration should be resumed, until a physician arrives to take charge of the case.

While this artificial respiration is going on there should be as much of the wet clothing removed as possible, without interfering with the respiration. Artificial respiration must not wait for anything. When as much wet clothing has been removed as can be, the legs and lower part of the body should be thoroughly wrapped in blankets, but so as not to interfere with the person who is doing the artificial respiration.

Electric Shock.— The danger of coming in contact with strong electric currents is ever increasing with the greater number of high tension wires. A person so shocked should be immediately removed from the electric contact, if the power can not be immediately shut off; but those who attempt to save the individual must not take chances of being electrocuted themselves. Thick rubber gloves, if at hand, should be used, and rubbers or rubber-soled shoes worn; or masses of clothing may be used on the hands, or wood or rope protection may be utilized, or anything that is a nonconductor.

All tight clothing around the throat or chest of the shocked person must be loosened, and artificial respiration must immediately be begun. Artificial respiration should be persisted in until a physician says that it is useless to continue. Care should be taken to remove, if possible, any foreign body that may be in the mouth, such as false teeth, tobacco or chewing gum.

BURNS.—Burns, of course, vary greatly in degree, from a simple blister of a small area to destruction of tissue or to the burning of large surfaces of the body. When hot air or flame is inhaled the membrane of the throat and larynx swells and death may occur very quickly. When large portions of the surface of the body are severely burned the danger from death as a consequence is always more or less imminent.

When there is a *deep burn* in any small area, a simple lotion should be immediately applied, such as a teaspoonful of bicarbonate of sodium to a glass of warm water; but a physician should be immediately consulted lest the destroyed tissue cause poisoning of the body. Also it requires good judgment as to the proper treatment to cause healing without serious loss of skin and other tissues, and to prevent, if possible, contractions of the scar tissue, which may cause deformities or interfere with motion. It should be remembered that blood poisoning easily occurs from the destruction of tissue by burns or any kind of cauterization.

A *simple burn* should be immediately treated by bicarbonate of sodium solution, and then kept pro-

tected from the air for a short time by a dressing wet with the solution. Depending upon the seriousness of the burn, in fifteen minutes to half an hour or longer the part may be gently dried and some simple dry powder applied to it, and then a protecting bandage of gauze applied. If a blister occurs later, a sterilized needle should be inserted in the outer and most pendent angles of the blister and the serum allowed to gently exude. Pain is relieved by such removal of the distention. Care should be taken not to destroy or remove the thin layer of epidermis which is over the raw blistered surface, as healing generally takes place very rapidly if this thin tissue is not lost. If a burn requires a wet dressing longer than twenty-four hours, a saturated solution of boric acid is better than the sodium bicarbonate solution. If even a small burn does not show signs of rapid healing, a physician's advice should be sought.

Convulsions.—A convulsion is always more or less serious and always requires investigation by a physician as to the cause. Convulsions occur most frequently in infancy and early childhood; the child's nervous mechanism is keyed to a higher tension, and it takes very little irritation to cause sufficient reaction to produce a convulsion. Various stiffening or spastic conditions may occur which are not actual convulsions, and in these conditions the brain is not affected. In real convulsions the brain is generally affected and the person after the attack is more or less in stupor or coma.

Many of the children's diseases begin with a con-

vulsion, and high temperature may cause a convulsion in a child. Over-eating and food poisonings are common causes of convulsions in children, and they may occur from painful congestions in the mouth, due to the eruption of teeth. This cause has been frequently denied, but the fact remains that convulsions readily occur in teething children. Sometimes a child who has convulsions may be found to be harboring worms in the intestine.

If the child has convulsions at shorter or longer intervals and they continue to occur without apparent cause, they are probably due to epilepsy, which of course requires special medical treatment. If a child, or any person, is noticed to have little "quiet" attacks, or forgetful turns, or seems to momentarily lose his association with external things, or stops in the middle of a speech, or looks blank momentarily, the cause is likely to be what is termed "petit mal," which is a mild form of epilepsy. Brain disease or kidney disease may cause convulsions. All of these serious types of convulsions are followed by coma, that is, stupidity, and the person can not for a time be aroused.

Death from a single convulsion is rare, although it is always more or less dangerous, and a physician should be called.

The immediate treatment of a child with a convulsion should be to loosen all tight clothing. Though there is primarily, probably, a lessened blood supply to the brain, soon there is always a congestion. Therefore, a child should be held in a bath warmed to the temperature of about 100°F. with, perhaps,

cold cloths applied to the head. As soon as the convulsion is over, or they cease if there is a series of them, an enema should be given; or if the child can swallow, it may be given a teaspoonful of syrup of ipecac to cause it to vomit.

If it is supposed that the child has taken some poison, a much larger dose of ipecac should be given; or, if it is an older child, half a teaspoonful of mustard stirred into warm water may be given to produce quick vomiting. The child should be then kept cool and at rest until seen by a physician.

If the convulsion is epileptic in type, great care must be taken that the patient does not bite his tongue. If possible, something like a piece of rubber, cork or rolled cloth should be inserted between the teeth.

If it is an adult who is having a convulsion, it should be remembered that the most frequent cause is epilepsy, and that after the convulsion the individual will lie for a time in stupor. All tight clothing, especially around the throat, should be loosened, the tongue protected as above suggested, and if possible the patient carried to a cool, airy place and allowed to lie flat with his head slightly raised. No other treatment is advisable until a physician has decided that something else should be done.

Chapter XV

Poisons

Acute drug poisoning, accidental or by intent, is most frequently caused by the following drugs: corrosive sublimate (mercuric chloride), carbolic acid (phenol), morphine (or any other form of opium), strychnine, arsenic and phosphorus.

Poisoning by *corrosive sublimate* is generally accidental, a tablet of this drug having been taken by mistake. Corrosive sublimate tablets should never be kept where it is possible for children to obtain them, or in any medicine cabinet where it is possible for anyone to mistake them for some headache or other type of tablet.

Symptoms of poisoning by this drug may be slow in development, if it has been taken on a full stomach. The first symptoms are vomiting and pain. Later there is diarrhea and, if the patient survives twenty-four hours or more, acute inflammation of the kidneys develops. The liver is also affected and jaundice may occur. Ulceration of the mucous membrane of the stomach and upper intestine may take place, if the patient lives more than a few days. No one is safe from the results of corrosive sublimate poisoning until a number of weeks have passed after the drug was swallowed.

Carbolic acid is generally taken with suicidal intent, and generally successfully if the solution is undiluted. Burns of the mouth from it are white and the odor on the breath is strong, and a diagnosis of the cause of the death of the individual is easily

made. One taking this drug may die within a few minutes. The symptoms are pain, burning, a feeling of suffocation, and soon coma and death.

There are many preparations that contain carbolic acid or phenol in some diluted form, which are used as antiseptic washes and are always poisonous. Such preparations may be taken by mistake. Death from these dilute solutions is not as rapid, and there may be no burning of the mouth and throat. The poisonous effects are on the central nervous system, or if the patient survives the kidneys become affected.

The symptoms of *morphine* poisoning, and those of any other form of opium, are profound sleep, coma and gradually failing respiration.

The symptoms of *arsenic* poisoning, which is generally taken, by intent or mistake, in the form of some rat or vermin poison, are vomiting, pain, diarrhea and prostration; if the patient survives, stomach and intestinal ulcerations and liver and kidney inflammation occur.

The symptoms of *strychnine* poisoning, which acts mostly on the central nervous system, are convulsions occurring with greater and greater intensity until the patient dies from muscle spasm and inability to breathe.

Phosphorus poisoning may be due to taking some form of rat poison, but most frequently occurs from children swallowing match heads. The symptoms may be very slow in developing, if there is food in the stomach. The first symptom is pain, then vomiting, diarrhea and prostration which may cause death within a short time. Very frequently death does not

immediately occur, and there may be many days of the symptoms of ulceration of the stomach and intestine and inflammation of the liver and kidneys.

Industrial Poisoning.—Some industries offer more or less hazard to health. Such hazard may be due to the unavoidable location of the industry; to an unavoidable high or low temperature needed for the industry; to humidity; to dust that can not be all avoided by suction drafts; to possible poisoning from metals that are used in the industry, whether lead or radioactive substances or, more commonly, to the very many aniline poisonous compounds.

Instruction is given to all workers in hazardous industries in the extra care necessary to protect themselves from harm. Personal cleanliness is always of great importance. Also the workers should not be allowed to eat in rooms where poisonous substances are handled. In very many instances the working clothes must be removed at the end of the day's work, if the occupation is such as to contaminate them.

Many industrial plants not only have an emergency medical service, but also examine their employees at regular intervals. If a worker in any industry or in any office, as well as anyone whose work is at home, begins to lose his appetite; to lose weight; to be sleepless; to look pale; to have some skin inflammation; or in any other way begins to be abnormal he should seek medical advice immediately, and not wait until he or she is really ill.

At the present time *lead poisoning* is rather rare, even in occupations in which lead is used. Obstinate

constipation is one of the first symptoms of chronic lead poisoning. Another symptom, which is insidious but should be noted, is anemia. Later serious disturbances from chronic lead poisoning are colic, paralysis of some muscles, and disease of the arteries and kidneys. The most dangerous occupation to-day, as far as lead is concerned, is in garages where the vapors from gasoline containing lead may be inhaled. Poisoning from this lead-containing gas is well understood, and great care is taken that it be not inhaled. Carelessness, however, may cause acute poisoning. It is quite likely that in driving in traffic, where the car or truck ahead is using this lead-containing gas, the fumes from the exhaust may enter a closed car and cause temporary headache and other disturbances. Repeated slight poisonings can cause more or less chronic disturbance, especially asthma. Lead has been found in the dust of garages even where ethyl gasoline has not been used, which emphasizes the necessity for keeping all floors, in every industry, clean. It also emphasizes the necessity for every worker having clean hands when he eats, and for eating in an atmosphere that is clean. Eating lunches in the occupation rooms should not be allowed.

As more *aniline* preparations are used in industry, more poisoning from this type of chemical occurs. Some paints, varnishes, dye stuffs, the benzols, the benzines, nitrobenzine, and other types of aniline can cause severe poisoning. They may cause only irritations of the skin, or may cause acute inflammation and severe and even fatal illness, sometimes a

number of hours after the poison has been received. Shoes that have been dyed have caused very dangerous symptoms when worn soon after the dye has been applied.

The first symptoms of some of these poisonings is dizziness, then faintness, weakness and headache, and later disturbed breathing, rapid heart and trembling. Sudden collapse and unconsciousness may occur, and sometimes there are convulsions. In other words, such poisoning is serious.

Dyed furs and dyed clothing may cause inflammation of the skin, and may even cause general poisoning. Hair dyes, hair tonics and shampoos, and some toilet preparations have been found to cause poisoning.

Inflammation of the skin may occur from chemicals used in the rubber industries. Also very serious poisoning may develop in those taking part in the manufacture of luminous watch dials, and from the handling of any luminous paint.

Chapter XVI
The Skin

If the skin is generally too moist and perspiration is excessive, or the skin is always too dry and perspiration almost absent, there is something abnormal about the person, and a careful diagnosis must be made as to the cause. If little pus spots occur anywhere on the body, except possibly on the face, there is likely to be some chronic infective cause, most frequently teeth or tonsil infection.

Acne spots on the face can often be prevented by very careful, properly advised cleanliness, not too much hot water, and not too many toilet powders. The general condition and the cause should be investigated. It is of frequent occurrence during adolescence. Intestinal indigestion tends to promote this eruption. It is frequently due to too much oily secretion of the face, and while cleanliness is necessary, especially before going to bed, too hot or too cold water should not be used, and also the face should not be fomented with heat which increases the secretion. Plugging of the little oil glands on the surface with dust and dirt causes the formation of so-called "blackheads" (comedones). The result may be a black speck, or the canal may become infected and cause a pustule which later must be evacuated, often causing a scar. If the acne is severe and persists, a skin specialist should be consulted. The future appearance of the face depends on stopping this sort of inflammation.

Girls and young women must remember that the cosmetics they put on their faces are not healthful in almost all cases. Some of these cosmetics are even poisonous, and they rarely are of benefit to one's complexion, especially in the amount that is now used.

ITCHING.—Itchy eruptions such as *hives* are generally caused by some food poisoning or some digestive irritation. If any particular food is known to cause this condition in an individual, he should not partake of that food. When it occurs, the proper treatment is a cathartic, and a very mild, almost starvation diet for twenty-four or thirty-six hours, and the local application of alkaline solutions, as bicarbonate of sodium solution, and simple dry powders, as ordinary cornstarch. Drinking alkaline waters, as Vichy, or taking bicarbonate of sodium is always of benefit.

The *bites* of insects, of course, cause localized itching, and the treatment is, if possible, to avoid these insects. On irritated bites a drop of spirit of camphor or some strong menthol solution will generally stop the itching. A lotion of a teaspoonful of oil of cedar, two teaspoonfuls of spirit of camphor, and two teaspoonfuls of oil of citronella applied to the hands and face, when they must be exposed to mosquitoes, will prevent these insects from biting.

Quite a number of drugs may cause eruptions in certain individuals. This should be recognized and the drug stopped. Certain foods may cause general itching, even if hives are not caused. Certain diseases cause persistent and uncomfortable itching,

and when it continues, the person should consult a physician to ascertain the cause. Any localized chronic infection may cause these disturbances of the skin. Some parts of the body are especially prone to itch, due to irritating secretions. Many persons can not wear a garment that contains even a small amount of wool next their skins without having very uncomfortable itching.

An acute attack of skin irritation should be treated the same as has been described for hives, and for several days, when general itching has been caused or almost a general inflammation of the skin has occurred, the diet should be milk, if it agrees, and cereal. Later vegetables and fruits, which the person knows not to be the cause of irritation in his case, may be taken, and still later meat once a day, until the normal diet is reached.

The treatment of the skin should be bathing with bicarbonate of sodium solutions and then drying with soft towels. Some simple drying powder, as corn-starch, may be dusted over the irritated parts; the underclothing worn should be linen or silk. An artificial silk termed rayon is also very cool.

If itching persists or recurs on any part of the body, parasites must be suspected and sought by the skin specialist. Unskilled treatment of parasitic conditions of the skin is very inadvisable, as it frequently inflames the skin without eradicating the parasites.

Ivy Poisoning is well understood by most everyone. Some persons are so susceptible to it that they can not touch poison ivy, poison oak or poison

mercury, as it is variously called, without being poisoned. This generally occurs on the hands and face and other exposed parts of the body, although it may enter the clothing and cause poisoning later. Certain types of sumach also cause the same kind of poisoning. The condition requires medical treatment.

Some types of plants can also cause poisoning, but not as severe as ivy poisoning. A few house plants, especially the primrose, may cause an eruption not unlike eczema.

When one knows that he has been in contact with poison ivy he should wash the part very carefully and repeatedly with warm water and soap and should rub it hard with gauze wet with this soapy solution. The gauze, after using on a small part, should be thrown away and another piece substituted, so that there will be no question of transplanting the poison from one part to another. Such simple treatment may prevent poisoning.

Eczema.— The most common inflammation of the skin is *eczema*, and it occurs in very many types and at all ages, and is especially frequent in young children. It often requires not only local treatment but internal medication. Sometimes the diet is wrong. Sometimes the person comes in contact with irritants, which he has not recognized. The liability of aniline dyes causing skin poisoning should always be remembered. Some cosmetics cause skin eruptions and a few of them have even been known to cause death. Some highly colored lipsticks have been found to be colored with tinted aniline. One can

not be too careful in using cosmetics that are not offered by a well-known maker of these preparations. Dana[1] said that there was annually used in this country some 240,000,000 packages of rouge. He found poisonous substances in eighteen hair dye preparations.

Almost all forms of eczema are made worse by water. Therefore excessive bathing of eczematous parts should be avoided, and strong soap should not be used. Whether the inflammation requires a dusting powder or an ointment or an oil must be decided by the skin specialist. One can not decide these things for himself.

Eczema in Children.—Young babies are especially likely to have some sort of skin inflammation, and to prevent its becoming a chronic condition it should be properly treated and the cause ascertained in the beginning of the trouble. If a child has very red cheeks every time he is exposed to cold or wind, generally such exposure should be prevented; the parts may be greased with cold cream or lanolin before exposure to the air. In any acute inflammation of the skin or where there is a tendency to intense redness soap and water should be used as little as possible on the part affected.

Intolerance to certain foods seems to be a very frequent cause of eczema in children, especially young children. The cause may be found to be due to a protein, perhaps most frequently eggs, and sometimes milk. Starch proteins may be a cause, as wheat and oats, and such carbohydrates as potato

[1] Dana, H. S.; Med. Jo. and Record, Feb. 17, 1926 p. 231.

and crackers may cause it. Fats may cause eczema. Sometimes a nursing child develops eczema from substances excreted in the mother's milk, and depriving the mother of such foods as cause the irritation will stop the eczema. An unexpectedly nervous child may be such because the mother's milk contains caffeine, which she is taking in tea or coffee.

A careful study of the feces will show the kind of food that is not properly digested and therefore may be the cause of irritants reaching the blood and causing inflammation of the skin. Occasionally this disturbance of the skin is due to insufficient secretion of the thyroid gland and will be benefited by very small doses of the extract of this gland.

Any inflammation of the child's face or any crusty deposits on the child's scalp call for immediate treatment, as if it becomes chronic it is difficult to cure.

Chapping of the hands in cold weather is often due to an insufficient amount of oil or fat in the skin. Those who are subject to this condition should always keep their hands as warm as possible during cold weather. The hands should be covered at night with some bland oil, or cold cream or an animal fat (as lanolin), whichever is found the most satisfactory application. Various fine lotions can be obtained. Massage is good for such skins.

Chilblains is another type of injury from the cold. Especially is this likely to occur where the shoes are tight, and having once occurred, if the part again gets very cold it will recur, sometimes year after year. Often there is very unpleasant burning and

itching as well as local redness. Those who have these chilblains especially notice it when they remain in a warm room, or after going to bed. Rubbing of the part affected, keeping the legs and feet warm, and wearing shoes that are neither too large nor too small may prevent the winter's chilling. Sometimes this condition of so-called chilblains and cold fingers or cold other parts of the body may be due to an endocrine gland disease, and if there is a tendency to blistering near the fingernails, medical help must be sought.

Whenever a *pusy* or *scabby* skin *eruption* occurs, and especially if it occurs in different parts of the body, due to scratching and the transference of infection, medical help must be immediately sought. This condition is contagious and goes from child to child through a family.

The eruption termed *ringworm*, which may occur on any part of the body, must receive skilled treatment. It is not generally recognized that many of the rednesses and irritations between the toes and on the feet are due to ringworm, but such is the fact. It is of very common occurrence in those who attend gymnasiums, use public bathhouses, or who play golf and use the showers in club houses. It is contagious, and is acquired by an infected person walking on mats, etc., from which innocent barefooted individuals pick up the germ. Therefore, each person should wear his own bathing sandals in public bathing places.

The best treatment for the condition must be decided upon in each individual case. Free use of

peroxide of hydrogen solution, in full strength, with ordinary soap and water carefully used, not harshly used, and then keeping the feet cool and using dry powders may stop the infection, unless it has become firmly established. The powder used should be a dry, not an oily one.

Warts are of frequent occurrence, especially in children, and at times seem to show some contagiousness. Sometimes they disappear as unexpectedly as they have come, but they should not be allowed to persist. They may occur in older persons on the feet, where they are very troublesome and painful if they occur on the bottom of the feet. So-called soft corns which occur between the toes are really a form of wart. Some of the callus on the sides of the feet is really a warty growth.

An *ingrowing toenail* should never be neglected. Advice should be sought and proper treatment carried out, as sometimes very serious infection occurs from such a simple thing as an ingrowing toenail. Toes have been lost, and sometimes feet have been amputated on account of carelessness in the treatment of an infection of the toes or feet. All serious injuries of the feet, and even a blister, must receive very careful attention. Sometimes lockjaw occurs from foot injuries, and serious general infection can occur from a simple blister.

The care of the *hair* is too large a subject to discuss here, as there are so many causes for falling hair and for dandruff. Too frequent washing of the hair, unless the occupation is very dusty and the hair can not be protected, is harmful. Theoretically, a

shampoo once a month is generally sufficient, although once in two weeks may not do harm. The scalp may become dry and there may develop a form of simple eczema, or some other skin disease may attack the scalp.

The term "dandruff" is frequently applied to the falling of dust that comes from a dry scalp. It may mean that the trouble is very simple, or it may mean that the trouble is serious enough to have skilled treatment, lest the patient become bald. Some scalps are too oily; some are too dry. Some forms of dandruff are doubtless due to a germ, and there should never be any interchange of combs and brushes among members of a family. Too tight hats should not be worn by either men or women. Too much curling of women's hair by the aid of heat or electricity is also not advisable.

One should never use any form of hair tonic, or try too many types of shampoos or local applications to the scalp, without the advice of a skin specialist. A simple soap, as ivory or castile, makes a perfectly safe shampoo. Most of the shaving soaps make good shampoos.

In some families the men become bald young; in others they do not become bald until old age, and perhaps not then. In other words, there is family tendency to loss of hair.

When there is *localized pus* or oozing of serum from any part of the body, medical advice should be sought. It means a sinus of some kind, and external applications will not stop it; the deeper part must be properly treated. Any discharge from the ears always

requires medical advice. It is never harmless, and proper care may mean the difference between good hearing and deafness for the rest of one's life.

EMOLLIENTS. An emollient is a bland oily or fatty substance which has no properties except to soothe the skin. They are used to soften dry skins, for massaging and to protect irritated surfaces. Many are made with petroleum oils, as vaseline, and many with animal or vegetable oils. Cacao butter is one of the most soothing and is especially used for massage and on rough skins. The popular *cold cream* contains spermaceti (whale oil), almond oil and borax. An ointment that has become rancid should never be used.

Zinc ointment is made with white petroleum (similar to white vaseline) and zinc oxide. This ointment is soothing and healing for eroded and inflamed surfaces. Diluted glycerin and witchhazel solutions are bland lotions, and sodium bicarbonate solutions and milk of magnesia are also soothing to an irritated skin. Olive oil and especially almond oil are emollients, the latter being thinner and of value in removing dust and dirt from a part, which, if irritated, should not be bathed with water.

It should always be remembered that, whenever a plaster, as zinc oxide plaster (adhesive plaster), is applied to any part of the body, the skin should first be rendered clean with soap and water and then dried, and often it is well to cleanse with alcohol or with peroxide of hydrogen solution. This is to remove all possible infection, dirt, and oily or greasy secretions before the plaster is applied,

which would seal these substances in the skin and cause irritations. Many times negligence in cleansing the skin is the cause of the irritation found after the plaster is removed. Of course the plaster must not be allowed to remain on too long. The same precautions for cleansing the skin should be taken when hot fomentions or poultices are applied. The old flaxseed poultice, however, is rarely now needed; hot fomentations with water or with medicated solutions are better.

The skin should also be made clean when a mustard poultice or paper is applied. A mustard paper can be obtained at any drug store and, after moistening, applied to the skin. If the skin is very tender a thin piece of gauze may be placed between it and the skin. A mustard plaster may be made with equal parts of mustard and flour; or flaxseed meal may be substituted for the flour. This is stirred into a paste with warm water and the paste spread on a piece of thin cloth, or placed in a cheesecloth bag and then applied to the skin. It must not be applied hot. Depending on the age of the patient and the character of the skin, it may be left on for fifteen to thirty minutes, but never long enough to produce a blister. For a child a plaster may be made of ground spices. However, at the present time these plasters are not much used, and, as above stated, neither are flaxseed poultices much used. Hot watery fomentations with a hot water bag placed on the outer side to keep them warm are as efficient.

Various stimulating ointments are obtainable,

such as contain menthol, salicylic acid, turpentine, capsicum, etc. These are rubbed over painful nerves or are used as slight irritants. Blisters should not be caused. Iodine is frequently used over a painful region, especially a joint, but it should never be allowed to cause a blister. The old fly blister (cantharides) is now rarely used, and should never be used unless ordered by a physician. It is not as frequently used by physicians as it should be, as it often is of great benefit.

Various stimulating liniments may be used on different parts of the body, the weakest of which is the so-called camphorated oil. Stronger liniments should rarely be used without the advice of a physician. This is especially true as the cause of the disturbance may be something that can be removed, and when the cause is inoperative the trouble will generally cease. Neuralgias, neuritis and joint pains may be caused by some focal infection, as in the teeth or tonsils or elsewhere; therefore treatment with liniments would be of no permanent avail.

Cosmetics.—It has been estimated that the United States, and probably this means mostly the women of the United States, spends not far from $300,000,000 a year for cosmetics. Some of these cosmetics are not innocent and carry poisonous substances. This is especially true of some of the so-called beauty preparations, bleaches and freckle lotions.

There are very many simple dusting powders the basis of which is generally boric acid or mag-

nesia. Simple cornstarch makes one of the most efficient drying powders. Some of the stearates are good protective powders, but are dangerous for a baby or young child to obtain and put into the mouth, severe poisoning having been thus caused. Fuller's earth makes an efficient drying powder. Orris root occurs in some toilet powders, and occasionally a person who is subject to asthma is susceptible to this powder, it causing asthmatic attacks.

Chapter XVII

Nostrums and Quackery

Nothing in the following is intended to depreciate or minimize the splendid preparations of drugs and foods that are offered by the standard pharmaceutical firms. Both laymen and physicians are indebted to these firms for their untiring research, with expense of time and money, to provide new and better drugs and preparations. No one should begrudge them a proper financial return for their non-secret, standardized and valuable products. They also have a right to protect by trademark names these preparations, provided each name honestly and not camouflagely, denotes the contents of the package.

The repeated discussions of proprietary rights and legitimate selling names cannot be here even outlined. Suffice it to say that any drug or preparation that has been accepted by the Council on Pharmacy and Chemistry of the American Medical Association and consequently appears in the annual issue of the book entitled "New and Non-official Remedies" is an honest product and without false curative claims.

Anyone who wishes to know the standing of a drug or a preparation of drugs, or of a tonic or food may address the above Council at the office of The American Medical Association, 535 North Dearborn Street, Chicago, Illinois.

The United States government forbids the use of its mails for promoting the sale of misbranded

foods and medicinal preparations. It also prohibits the use of its mails for distributing packages or literature that contain false therapeutic (healing) claims.

The belief in mysterious medicines and mysterious methods of treatment dates from the earliest times, even for centuries before the Christian era. The increased knowledge of disease and of medical science possessed by the laity and disseminated by books, magazines and the daily press has not prevented even the civilized and educated from belief in treatments that are mysterious. Consequently, nostrums are still freely imbibed, unusual and unauthentic treatments are taken, and patent medicine firms and medical and religious fanaticism prosper.

A *nostrum* is a secret medicine sold in an original package, which often has no medicinal value whatever, or for which curative values are claimed which are extravagant and impossible, or which contains one or more drugs that should not be freely taken. The literature that is enclosed with all nostrums is intended to work upon the fears of the patient to make him believe that he has diseases which he has not, and to encourage him to continue to buy this remedy, which may be positively worthless or positively harmful, or may create a craving for one of its ingredients. Most nostrums are sold at a price that is hundreds of per cent. beyond the cost of the drugs contained. Nostrum makers and promoters, who thrive on suffering humanity, have opposed, and will continue to oppose, every act of legislation in Congress or State that compels

them to declare upon the labels of their preparations the drugs they contain. Either the simplicity of the ingredients of the preparations would kill the sale of the mixture, or the poisons that they contain would prevent most patients from taking them. At the present time the alcoholic content of many of the liquid preparations is attractive, rather than repellent, and the alcoholic content must be printed on the label of each preparation, in accord with the present prohibition law.

Prescription clerks must be licensed. In other words, a drug store clerk without a license is supposed not to put up prescriptions containing poisons, but he may sell over the counter an original package of a preparation that contains a poison. Druggists cannot lawfully sell a narcotic or alcohol in any form except on prescriptions signed by licensed physicians. Each physician must have a numbered permit for prescribing any narcotic drug, and if he prescribes alcohol he must fill out special prescription blanks which are furnished by the Government. A druggist, however, or any one of his clerks may sell a nostrum or an original package which contains a narcotic or alcohol.

The alcoholic content of patent medicines has varied up to about fifty per cent.; good whiskey contains only about forty-one per cent. Some of the liquid preparations recommended for young women who suffer pain, when taken by the method and in the amounts advised, will cause a real alcoholic indifference to internal conditions or external surroundings.

The faith in mysterious influences which has been handed down from the dark ages is still more or less in evidence. A *talisman* was a metal, stone or wooden figure supposed to have magical power to divert death or disease and to control evil spirits. An *amulet* differs from a talisman in that it must be worn on the person, while a talisman might be deposited in some special safe place. Amulets varied from precious stones to all kinds of objects of the animal and vegetable kingdoms, even pieces of old rags and scraps of illegible writing were thought to be curative. A talisman possessed by Sir Walter Scott was said to consist of feathers, parings of nails, hair, etc., wrapped in a lump of clay. Not very long ago camphor bags were hung around the necks of children to prevent diphtheria, and coral or amber necklaces were worn to prevent croup. Various precious stones and metals are supposed to have particular properties, and some, as the opal, are considered of bad omen and to cause bad luck. Horse chestnuts are still carried and brass or iron rings are still worn on the fingers to prevent rheumatism.

A *charm* differs from an amulet in that it might be a word or sentence, or a substance applied in some prescribed manner, or it might be an incantation.

Apparently from the earliest times the influence of fear in causing disease, and especially during an epidemic, was recognized, and if this fear could be overcome, the individual might be benefited. During any epidemic, even in the present age of influenza for instance, many persons develop symp-

toms of the prevailing disease and go to bed with it, and even the attending physician may mistake their imitated symptoms and believe the disease to be present.

It never has been denied in any age, even in the time of Hippocrates, the first noted physician who lived several hundred years before Christ, that the mind was not a large factor in all diseased conditions. The power of the mind over the body has always been recognized by every physician during all the ages. Therefore, our faith healers have discovered nothing new. Consequently, all of these talismans, amulets, charms, and, at the present time, prayers can prevent conditions that are caused by fear and imagination. Also, any powerful impression made on the mind will benefit any diseased condition. Nothing promotes disease and the advance of disease more than mental depression. Every physician recognizes this and stimulates each patient's mind accordingly.

Long lists of ridiculous talismans and amulets and beliefs could be enumerated did space allow. Not many years ago in our own enlightened country, namely, in 1895, in Denver, Colorado, Francis Schlatter, a shoemaker, claiming he had the divine gift of healing, stood on the street day after day from nine o'clock in the morning until four in the afternoon, clasping the hands of sufferers from all kinds of ailments, even the deaf and the blind. Persons stood in line way down the street waiting their turns. Six years later, in 1901, Schlatter "the divine healer," as he called himself,

was confined in the workhouse at Washington, D. C. He died in the poorhouse.

Let it be remembered that a quack healer could not succeed unless civilized as well as uncivilized mankind believed in the mysterious treatment of disease. Some years ago we had in this country a magnetic healer who treated by way of the mails. This man it was ascertained was taking in $2,500 a day and agreeing to give a hundred and twenty-five hours in each twenty-four to absent treatment of his patients. Another magnetic healing concern of a few years ago was treating 25,000 patients by these absent methods.

Mental science treatments really mean absent treatments, and a woman in one of our southern states claimed to heal anything, even went so far as to claim she could "get a man out of jail, make a new set of teeth grow, and make a leg grow on an amputated stump"! This woman's business was so great that she did not begin to read all her letters, and did not recognize that the stump of an amputated leg of a woman was not growing, after a long period of treatment, and consequently the healer got into the clutches of the government.

Many mechanical appliances are sold to cure all kinds of diseases, especially magnetic belts, magnetic boots and other magnetic apparatus which are bought not only by the illiterate but by the very highly educated, all of which are frauds. A garlic smell was sold at a high price as a cure for deafness. A little sulphuric acid, in water, was advertised and sold as a preventive of yellow fever. Pungent,

pleasant smells are now sold to prevent colds and influenza. Witchhazel extracts have been advertised and sold to prevent epidemic meningitis. Medicines have been sold to increase the growth of the cartilage and increase one's height. Others are sold "to bleach the darkest skin," and "to straighten the kinkiest hair." A half ounce of rheumatism medicine has been, and is, sold for two dollars, and contains only a little acid and a little salt. Cures for obesity almost invariably contain thyroid (goiter) gland substance, which is a dangerous treatment unless one is under the care of a physician. Nostrum cures for alcoholism contain alcohol; nostrum cures for malaria contain quinine; nostrum cures for the morphine habit contain morphine; and nostrum laxative preparations all contain one or more simple laxative drugs, and are not wonderful or unusual treatments. Almost all of the cures for pain, colds, headaches, etc. contain coal-tar drugs that are depressant to the circulation. Among the worst quackeries are those advertised for the cure of female diseases.

At the present time the lay world has become impressed with the value of *radioactive substances*, and the nostrum venders, always up to the times, have taken advantage of this belief, namely, that radium things can cure most any disease or diseased condition. Some of these "radioactive" nostrum preparations have been found to contain less radioactive substance than the ordinary drinking water of most towns and cities. For years there has been no radium mined in this country, and for

all practical purposes there is enough radium already produced for the scientific use of physicians and surgeons. The expense of producing and marketing real radioactive substances would be too great for profit from any price that the producer could ask. Also, if real radioactive substances were incorporated in medicines and sold for medicinal purposes, the harm from the action of these preparations would preclude their use. Therefore, it is self-evident that nostrum substances marketed as radioactive contain so little that it is harmless and useless, and the sufferer buying such preparations is enriching the owner and promoter, impoverishing himself, and doubtless neglecting some condition that should be properly treated.

Some years ago a "Humanity Baking Powder" was sold and was stated "to raise the human race to heights hitherto undreamed of." This particular product not selling as rapidly as it should, the promoter advertised and sold what was termed the "Waters of Life." It was stated that these waters came "from a spring that was identical with the waters that gushed from the rock which Moses smote," and it was claimed, besides many other things that this water could do, that it would cure Bright's disease and diabetes in thirty days. Now, at the present day and moment, there is advertised a book on personal magnetism that will cause the student "to have power, influence, fame and happiness."

The saddest fraudulent exploitations are the cancer cures. These fraudulent promises of cure have been

promoted for years and continue to be promoted. Even now, at the present time, a cancer cure hospital is sending literature to ministers of the gospel asking them to give the names of those in their congregations who are suffering from cancer or tumor, and then on receipt of such names they promise to send presents to the clergyman. Enclosures with these circulars state, among many other things, that operations for the removal of cancer increase their growth.

Another very sad quackery is so-called treatments for tuberculosis. They constitute promises to cure absolutely incurable cases, even when the symptoms placed on the blanks which they send show that the cases are hopeless.

Thousands and thousands of letters are written to these patent medicine firms by sufferers who are told that "their letters are confidential." As a matter of fact, when the firm has obtained all the money that it can from the sick persons, it sells to some letter brokerage firm its hundreds or thousands of letters that are no longer of value. These letters are grouped by the broker into diseases, such as tuberculosis, cancer, syphilis, obesity, etc., etc. They are then sold in bundles of hundreds or thousands to some other patent medicine firm. This firm sends to these names and addresses its letters exploiting its treatment to these poor patients, and when they can sell no more of their product, the letters are again sold, and again bought, and so on, sometimes for years.

This is no myth. Some years ago the author of

this book had a young woman, who was not sick, answer an advertisement of a man who promised to cure everything. Part of the advertisement stated "Is there a limit to this man's healing power? Has he the power divine?", and further stated that he would send treatment free of charge, that he "believed it his duty as a Christian to God and man to heal all who are in need."

This young woman gave a fictitious name. The answer to her letter brought a symptom blank which was made out, at my dictation, to show a condition of tuberculosis of the lungs (consumption). The next letter stated that examination of the symptom record had shown that she had "tubercle bacilli in her blood that he could cure." Medicine was sent free for about three days, and future treatments would be sixteen dollars for a month's supply. As "Bertha" (the young lady's assumed name) did not "ante up" the amount, the treatment was reduced to six dollars. She still did not buy the medicine, and a year later a letter came from another patent medicine firm to this same fictitious name, stating that this man could cure her of her troubles. Another symptom blank came which was made out according to my direction to show serious progress of the lung disease. Again a letter came stating that she could be cured, and the medicine would cost so much. Later her confidential correspondence was again sold, and a letter came from a third patent medicine firm also telling her they could cure her, although we sent the symptom blank showing that her case was perfectly hopeless. To our sur-

prise, two or three years later still another patent medicine firm addressed her by her fictitious name.

This chapter has been written with the hope that before any unusual treatment is begun or before any patent medicine is taken the contents of which is not known, the individual will inquire of the local Board of Health as to the standing of the treatment or medicinal preparation, or will write to The Council on Pharmacy and Chemistry of the American Medical Association, as above advised. Much money may be saved and much sorrow prevented, and, perhaps, life saved by not neglecting the proper treatment of a serious condition by the use of nostrums and treatments that cannot cure.

Index

A

Accidents 262
Acetone 38
Acidophillus milk 62
Acne 281
Adenoids 166
Agar 61
Air 133
American Medical Association 294
Amulets 297
Aniline poisoning 279
Antiseptics 217
Appetite 55, 73
Arsenic poisoning 277
Arteries 27
Arteries, hardening of 228
Artificial respiration 270
Asthma 239
Athletics, competitive 199
Autointoxication 60

B

Baths 126
Baths, cold 129
Baths, sand 128
Baths, sun 128
Bile 51
Blood 30
Blood, arterial 24
Blood corpuscles 31
Blood plasma 30
Blood pressure 28
Blood, venous 24
Botulinus poisoning 109
Bowel infection 60
Bran 61
Breath, bad 57
Burns 272

C

Caffeine 53, 90
Calcium 84
Calories 67
Candy 81
Capillaries 28
Carbohydrates 69, 79
Carbolic acid poisoning 276
Carbon dioxide 24
Carrier of disease 217
Cathartics 62
Chapped hands 286
Charms 297
Cheese 77
Chilblains 286
Child, examination of 177
Child, feeble-minded 189
Child, management of 170
Child, nervous 169
Child, precocious 184
Child, the 169
Chiropractic 117
Chocolate 96
Christian Science 119
Cigarettes 202, 255
Circulation 25
Climate 129, 134
Clothing 121, 131
Cocaine habit 249
Cocoa 96
Coffee 53, 89
Colds 238
Colon 49
Competitive athletics 199
Constipation 58
Convulsions 273
Corrosive sublimate poisoning 276
Cosmetics 292
Cough 236
Council on Pharmacy and Chemistry 294
Cretin 18, 190

D

Dandruff 289
Diet 70, 97
Diet, balanced 69
Digestion 49
Digestive juices 32
Diphtheria 244
Disease, carrier of 217
Diseases, preventable 234
Disinfection 215
Dropsy 33
Drowning 270
Drug poisoning 276
Druggist license 296
Drugless treatment 223
Duodenum 49
Dyspnea 23

E

Eczema 284
Eczema in children 285
Edema 33
Eggs 75
Electric shock 271
Electrical treatments 225
Elimination 37
Emergencies, managment of 268
Employment of females 194
Emollients 290
Endocrines 14
Enema 59, 63
Esophagus 49
Eugenics 9
Eustachian tubes 167
Examinations of pre-school children 177
Excretion 37
Exercise, heart in 198
Exercise, physical 196
Exercise, strenuous 196
Eyesight 178
Eyestrain 55

F

Fatigue, industrial 262
Fats 82
Feeble-minded 176
Fever 35
Fever, diet in 98
Food poisoning 108
Food requirements 69
Foods 65
Fruits 87
Fumigation 215
Functions of the body 21

G

Gargling 222
Gas poisoning 268
Gastric juice 50
Germicides 217
Germs 212
Glands, endocrine 14
Goiter gland 17
Growth 1

H

Habits 249
Hair, care of 288
Hay fever 239
Health axioms 111
Hearing 178
Heart 25
Heat 133
Heat prostration 269
Height 6
Hemoglobin 24
Hemorrhoids 59
Heredity 1
Heroin 251, 253
Heroin habit 251
Hives 282
Hunger 52
Hydrophobia 247
Hygiene 184
Hyperacidity 54, 62

I

Immunity 214, 227
Immunity, acquired 230
Immunity, natural 229
Immunity, passive 231
Indigestion 54
Industrial poisoning 278
Infant feeding 99
Infection 212
Influenza 238
Injury, treatment of 218
Insanity 10
Insects 232
Insects, bites of 282
Insomnia 46
Intestines 49
Iodine 86
Iron 24, 85
Islands of Langerhans 19
Itching 282
Ivy poisoning 283

K

Kidneys 38

L

Lactose 77
Laxative drugs 63
Laxative foods 61
Laxatives 59
Lead poisoning 278
Lime 84
Lingual tonsil 165
Liniments 292
Lockjaw 247
Lymphatic glands 167

M

Marathons 204
Massage 226
Meals, frequency of 74
Measles 245

Meat 65, 72
Medulla oblongata 22
Mental breakdown 266
Milk 75
Milk, certified 77
Milk, cows' 102
Milk, goats' 102
Milk, human 99
Milk, Pasteurized 77
Milk, Pasteurizing 103
Milk, soured 76
Milk sugar 77
Mineral oil 61
Minerals 83
Mineral springs 137, 141
Mongoloid idiot 190
Moron 176
Morphine habit 249
Morphine poisoning 277
Mouth 142
Mouth infection 147
Mouth, pyorrhea of 149
Mumps 245

N

Narcotic drugs 249
Narcotic habits 249
Nasal douching 219
Nasal sprays 219
Natureopathy 118
Nicotine 258
Nostrums 295
Nutrition 49
Nuts 77

O

Obesity 104
Old age 11
Opium habit 250
Osteopathy 118
Overweight 105

P

Pancreas, secretion of 51
Parathyroid glands 18
Patent medicines 223
Perspiration 34, 42
Phosphates 84
Phosphorus poisoning 277
Physical treatments 223
Physician, choosing a 116
Physician, Homeopathic 116
Physician, Regular 116
Physiotherapy 223
Pigmentations 43
Piles 59
Pituitary gland 19
Plasters 290
Pneumonia 238
Poisoning 276
Poisoning, aniline 279
Poisoning, arsenic 277
Poisoning, carbolic acid 276
Poisoning, corrosive sublimate 276
Poisoning, industrial 278
Poisoning, lead 278
Poisoning, morphine 277
Poisoning, phosphorus 277
Poisoning, strychnine 277
Poisons 276
Prevention of disease 227
Proprietary drugs 294
Proteins 65
Psychiatry 176
Ptomaine poisoning 108
Purins 72
Pus, localized 289

Q

Quackery 294
Quinsy 164

R

Rabies 247

Radioactive substances 138
Respiration 21
Rest cure 207
Rickets 5, 234
Ringworm 287

S

Saccharin 82
Saliva 50
Saratoga Springs 140
Scarlet fever 244
School hygiene 184
Schools 181
Scurvy 235
Seasons 129
Seidlitz powder 62
Shoes 123
Skin 41, 281
Sleep 43
Sleep of children 47
Sleep, to cause 47
Smallpox 245
Smoking 256
Smoking, effect of 259
Sodium bicarbonate 54
Sodium chloride 83
Springs, mineral 137
Statistics 192
Stomach 50
Strychnine poisoning 277
Sugar 80
Suicides 264
Sun rays 43
Sunstroke 269
Suprarenal glands 20
Swimming 126

T

Talismans 297
Taste 56
Tea 53, 89
Teeth 142

Teeth, dead 148
Teeth, malocclusion of 148
Teeth, preservation of 168
Tetanus 247
Theine 90
Thirst 53
Thymus gland 19
Thyroid gland 17
Tobacco 254
Toenail, ingrowing 288
Tongue 55
Tonsils 163
Toothbrush 158
Tragedy 264
Transfusion 35
Trench mouth 153
Tuberculosis 241
Typhoid fever 242

U

Ulcer of stomach 55
Ultraviolet rays 43
Urine 38

V

Vaccination 246
Vegetables 79
Vincent's disease 153
Vital capacity 22
Vitamins 77

W

Warts 288
Water 6, 32, 51
Weight 6
Whooping cough 243

Y

Yeast 61

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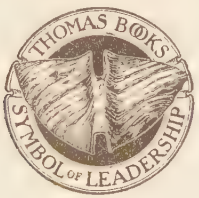

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